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ROBERT L. MOFFETT, *Editor*
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Business Manager
RUSSELL B. ALLEN

Publication Committee
WILLIAM H. LARKIN, *Chairman*
ALONZO L. JONES
ALLEN HUBBARD

* * *

Publication Office
40 Hilliard St., Atlanta, Ga.
Advertising and Executive Offices
6 Church St., New York 6, N. Y.

* * *

Send change of address to the National Society of Professional Engineers, 1359 Conn. Ave., N.W., Washington 6, D.C. on form 3578.

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THE NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
Headquarters: 1359 Connecticut Ave., N.W., Washington, D. C.

Vice-President
J. F. FAIRMAN
Vice-President of
Consol. Edison Co., of N. Y. Inc.
4 Irving Place,
New York, N. Y.

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Consulting Engineer
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447 Standard Office Bldg.
Decatur, Illinois

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4610 Hartwick Road
College Park, Maryland

Executive Director
PAUL H. ROBBINS
1359 Conn. Ave., N. W.
Washington, D. C.

Vice-President
ALAN GRIFFITH STANFORD
Vice-President
Robert and Company
706 Bona Allen Building
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NSPE Board of Directors and State Presidents Hold Meetings in Minneapolis

With representatives present from all but four Member State Societies, the Board of Directors of NSPE held an eventful meeting at the Hotel Nicollet in Minneapolis, on February 28th. The State Presidents assembled on March 1st for their meeting after participating in the prior discussions.

Very happily the NSPE meetings were held concurrently with the Silver Anniversary meeting of the Minnesota Federation of Engineering Societies, which got under way on February 26th.

The Minnesota Association engineers were hospitable hosts to the visiting guests from the National Society. All accommodations, including luncheons, dinner meetings and other arrangements were made under the very able leadership of the Minnesota engineers.

Non-Member States Also Represented

At the Board of Directors' Meeting were representatives from the following states where NSPE does not yet have Member State Societies: North and South Dakota, Iowa, Idaho and New Mexico. These representatives were on hand obviously to see what they could learn about the policies and organization of the National Society of Professional Engineers. They took a keen interest in the program of the Directors' meeting. They all expressed considerable interest in knowing more about the history, progress and objectives of the National Society. The National Headquarters office in Washington has been asked to furnish copies of the autobiography of NSPE as well as other material which can be used in each of these states for the purpose of interesting other engineers in the desirability of an early affiliation. It is believed that out of this meeting with the engineers from these states, the prospects for such affiliation has been materially improved.

Board Meeting on Friday

The opening session of the Board of Directors meeting was called to order by National President Ritchie Lawrie, Jr., at 9:30 A.M., Friday, February 28th. After the usual formalities of the opening were disposed of, Director S. L. Stolte, of Minnesota, introduced Hon. Hubert H. Humphrey, Mayor of Minneapolis, who addressed the meeting briefly. He extended a hearty welcome to the Society and to the officers and members present.

Most of the time in the meetings were taken up with the reading and discussion of the reports of standing and special committees.

Ray M. Fuller, Chairman of the Legislative Committee, presented a comprehensive review of the work of the Committee since the convening of Congress on January 3, 1947. His report emphasized the Committee's paramount interest in recent months with national labor legislation, and particularly with Congressional measures designed to relieve professional employees from being forced into heterogeneous unions or to become union members as a condition of employment. Chairman Fuller pointed out that the professional sections of S. 360 and H. R. 1754 would authorize professional employees to form and control labor organizations restricted to professional employee membership.

The Presidents and Directors present expressed keen interest in the other parts of Mr. Fuller's report dealing with various other proposals pending before Congress which are of direct interest to Professional Engineers, and his recommendations concerning a closer working relationship between the State Legislative Committees and the National Headquarters of NSPE.

The Legislative Committee, through its Legislative Bulletin, as well as personal contact and extensive correspondence, is attempting to keep members fully informed on all legislative developments. The 80th Congress has been marked by a literal deluge of bills affecting engineers. It was pointed out that most of these measures will not go past the Committee stage, but all such legislation affecting the profession must be watched with an eagle-eye, lest legislation be adopted which might be inimical to the best interests of the profession.

Membership Report

As Chairman of the National's Membership Committee, Lawrence E. Peterson presented an interesting and detailed report of the activities of this newly reorganized committee.

The general membership quotas for the state member societies and the details of the general membership program for 1947 were worked out at a meeting in Washington, D. C., on February 22nd and 23rd. Held at the Society's Headquarters office, the meeting was attended by four Area Membership Chairmen, the Society's Executive Director and the General Membership Chairman. The potentiality of the nation's professional engineers was studied intently with due regard for the practical limitations of the situation.

At this meeting it was decided to set up state quotas, under a grouping which provided four classes of quotas, based generally on the present membership and future prospects for each member state society. When these quotas were submitted to the meeting of the Board, it was interesting to note that some of the State officers were not satisfied with the quotas worked out for their states. They felt the quotas were too low. This led to numerous friendly challenges and to wagers between some of the states having the larger memberships over what their membership growth would be during 1947.

It was reported that as of February 23, the membership in the National Society of Professional Engineers was 14,549.

The Extension Committee

This year we have a new Committee, the Extension Committee. The work of this committee will be concentrated in the states where NSPE does not now have a Member State Society. Colonel M. J. Blew, the chairman, reported for this committee, with a detailed statement of the prospects for promoting a member Society in each of the non-member states.

Col. Blew concluded his report with the following recommendation:

"It is recommended that an Extension Committee be appointed in each State Society and local chapter whose functions would be to send to Area Chairman of the Extension Committee, the names of key personnel of their acquaintance in any of the non-member states. The location of key personnel in these states is our main desire at this time and all suggestions are welcomed. At the same time, it is desired to build up the membership-at-large as rapidly as possible, so that a nucleus will be ready for the formation of a state society when the time is ripe."

Some Trends In Engineering Education

By T. C. Brown

Editor's Note: Elsewhere in this issue of The American Engineer we reproduce the Report of NSPE's Committee on Education, which the Society is proceeding to implement. It will be noted that this report recommends very much the same things which Mr. Brown is urging in his discussion.

The present era is one which we must accept as a period not of reconversion back to the prewar status quo but of readjustment for the future. For a long time the colleges and universities have been an instrument of our democracy; sometimes they have been called bulwarks of our republic. They should not lag industry, but rather should lead it through research and through revision of the curriculum toward improved course content. The curriculum can become over-specialized, and conversely, it can become too general, causing a deficiency of flexibility in the first extreme and one of professional incompetence in the second.

We should promote in the student of today the richness and warmth of genuine inspiration that helped make our country what is it today.

THE VETERAN. Colleges and universities are passing through one of their "boom" periods. Surveys indicate that about two and one-half million ambitious college-minded people wanted to enter the colleges of the country last fall. Accommodations for about one million were made. Over 900,000 veterans wanted to attend, of which about two-thirds of this number completed the requirements for registration. As a group, the veterans are intensely interested in obtaining an education. A few of them complain about being rusty as a result of having their formal education interrupted; their grades, however, compare very favorably with those of non-veterans. In many cases the top standings of the class are those of veterans. Their mature mind is often an advantage.

Most of them are eager to complete their education and get out into their life's work before they are too old. This may force the college to continue the "accelerated" programs, by which is meant that education may be kept available the year around with full summer quarters.

The veterans and also the student body as a whole are choosing the social and physical sciences in preference to the humanities. There is a significant trend toward the technical in preference to the humanistic professions.

Veterans dislike the idea that they present a special problem. They want to be treated like average students. It is true that some veterans are not college timber but elected to enter college because "it looked like a good bet" and the G. I. Bill of Rights has made provision for what otherwise would have been financially impossible for many men.

In contrast with army instruction, they prefer the opportunity to enjoy classroom discussion, to challenge the radical statements of the professor, to learn facts in their own vocabulary, and to be able to recite them in their own phraseology. They resent needless repetition of trivial material or memorization of insignificant data. Army "slanguage" should be left outside the lecture unless it can be used very effectively. The instructor must be careful of anything that resembles regimentation, as it is usually resented in any form. Red tape must be reduced to a minimum. There are, however, a few students very submissive and appearing to be devoid of initiative and self-reliance.

The college has a responsibility to the veteran in providing vocational guidance and professional counseling. He may not know how to budget his time, adopt proper study methods and habits, or schedule his work from a long-range viewpoint.

Visual aids as used by the armed forces and the more effective and more rapid methods of educating the war trainee should be investigated and perhaps some of them adopted.

BETTER STUDENT SELECTION. Students may vary in ability to gain knowledge and convert it to practical use. More careful selection of high school graduates for engineering careers is essential. The admission of students of non-college calibre puts a detrimental strain upon the student, the college, the parent, the student body, and ultimately our psychoneurotic institutions. An improvement in counseling program in both high school and colleges will do much to alleviate this condition.

The founder engineering societies

T. C. Brown

Theodore Cecil Brown, born Paintsville, Kentucky. Graduate University of Kentucky BS in ME 1931, *professional degree M.E. University of Kentucky* 1936; *M.S., N. C. State College* 1940. *For the past ten years a member of the faculty of North Carolina State College, Mechanical Engineering Department, rank—Associate Professor. Registered engineer and carries on some professional work in addition to the college teaching. Member of North Carolina Society of Engineers, American Society of Mechanical Engineers, National Society of Professional Engineers, Raleigh Engineers Club, the American Society of Engineering Education. He is author of a bulletin published by the Engineering Experiment Station, North Carolina State College titled "Drafting Room Practices," and magazine articles. He is a Sigma Chi, and honorary member Pi Tau Sigma and Theta Tau.*

have made a concerted effort in this direction by providing useful material in the form of pamphlets and speakers to assist with high school and college guidance programs.

Graduate students as well as undergraduates should be carefully selected. This will necessitate more counseling and technical advisory work. Obviously some should not be encouraged to go on spending time and money on a professional education for which they are not fitted.

NEW OBJECTIVES. There is a definitive tendency by engineering educators to provide the engineering student with a broad or "more effective" educational program. The annual meeting of the American Society of Engineering Education (formerly the Society for the Promotion of Engineering Education) was held in St. Louis during June, 1946, and at this meeting a program was outlined which, if followed by engineering schools, will tend to liberalize and reduce over-specialization of the curriculum. Such a procedure points toward adopting a five-year plan. The University of Minnesota, Ohio State University, and Cornell University have already announced five year programs, and other schools are expected to announce similar ones this year. A four- or even five-year engineering course cannot provide ample time to learn much more than the rudiments of mathematics, chemistry, physics, and engineering subjects.

From the published academic proposals on changes and from surveys of professional societies, a uniform curriculum with the thought of an integrated approach should be established. These sources will blend practicality with idealism.

Previously the curriculum was composed of about 80% mathematics, scientific and specialized courses, with about 20% being composed of English, public speaking, business law, economics, and history. Psychology, philosophy, literature, and industrial management courses have of late gradually found their way into the curriculum. Industrial demands have influenced the engineering schools to give practical and in some cases a vocational tinge to the formal education of the student engineer. It has been charged that too much of the curriculum was made up of laboratory courses, or courses developing some particular technique. Industry perhaps, should share in the responsibility for this condition. They could use the graduate engineer largely because he could soon fit into the organization as a shop foreman, or superintendent, draftsman, machine operator, or the like without extensive orientation. Unless he could demonstrate unusual progressive ability, he seldom found his way into management positions. In view of this fact, a great many of the higher executives of industrial concerns have been recruited from self-educated men who have come up through the ranks or were graduates of liberal art, law, or business colleges. It is time to investigate, survey our present offerings, and endeavor to broaden the educational structure. Perhaps we should try to give the student more poise, self-assurance, balance and wider vision. He must see beyond the test tube how his discovery may help or hinder mankind.

With the increase in use of our various communication systems, with the tremendous demands upon transportation, and with the increase of mechanization of practically all of our industries, the engineer has had increased responsibilities in designing and operating many functions of our lives. Consequently, today we find engineers occupying places of much more importance to society than warranted merely by skill with the slide rule. We cannot let any other professional group exceed the moral responsibility to society. The use of the handbook work has been delegated to an engineering assistant or subordinate employee. The time is here when industrial and political executives realize that the services of the engineer are essential in higher echelons to cope with production, economic, transportation, and communication problems. To provide for this, we must produce better educated men—men with ability to analyze the situation, quickly determine the solution necessary, and carry the program out smoothly. Educational institutions must develop the students' thinking faculties for this broader aspect, if necessary at the expense of the descriptive phases of his courses.

To face a difficult problem in engineering practice, the engineer must use the principles of inductive logic. One conception that should be broken down early in the students' career in college is that the courses represent separate little bundles of knowledge. The teacher must point out and cement together the fundamentals of concurrent and successive courses. This may be illustrated by the teacher of mechanics who points back to the student's previous experience in mathematics and physics, then points forward to such courses as the theory of structures and bridges for the civil engineer, or kinematics and machine design for the electrical and mechanical engineers. Thus the student becomes more than a formula-minded engineer. It is excellent to have a fine array of mathematical processes and useful formula at the fingertips, but it is far more important to know fundamentals and have the broader concept of engineering.

In our teaching it seems best to build this ability of engineering resasoning upon a firm basis of fundamentals of mathematics, scientific subjects, economics, and perhaps business law and accounting, completing the last year with specialized design and in the last year exercising the student in integration of these; this last year of his college work seems to be the logical place to open his eyes to the reality and importance of the relationships of the various subjects.

Perhaps success of this broad conception of engineering education and this integration of subject matter will necessitate breaking down administrative barriers between college departments.

PROPOSED NEW PROGRAM. Without too many details, the following program is the goal toward which engineering education appears to be moving:

(1) *Thorough Basic Training in the Fundamentals of Mathematics and Science.*

The objective will include a practical working knowledge of mathematics through trigonometry with an introduction to calculus. A strong course in physics and inorganic chemistry will be included.

(2) *Introduction to Vocational Courses.*

A student can obtain and hold a job perhaps more easily if acquainted with certain shop courses like welding practices, pattern making, foundry processes, and the processes of the machine shop. However, engineering drawing and descriptive geometry is definitely more than just a course in vocational educational work; it is the language of the engineer, used in all

advanced courses in design, and the medium for exchanging ideas between the engineer and the shop or craftsman.

(3) *Application of Mathematics and Scientific Principles.*

The courses of applied mechanics, strength of materials, fluid mechanics, thermodynamics, kinematics, electricity, and similar courses should train the student in methods of application of the formulae learned in previous courses.

(4) *Factual Knowledge and Specific Professional Application.*

A limited amount of factual knowledge is necessary for the practicing engineer. It is believed this should be reduced to a minimum and offered in the third and fourth years. Care should be exercised to see that over-specialization does not take place. If more specialization is desired, it may be offered in a fifth year.

(5) *A Broad Training in Humanities and Non-Professional Subjects.*

(a) Business subjects such as accounting, business law, and economics should be encouraged.

(b) Courses in the humanities, such as history, government, literature, psychology, philosophy, sociology, public speaking, and perhaps art, should be given a place in the program.

Definite steps should be taken to aid the student in getting along with people, have proper discipline over orderly habits, have some participation in extra-curricular activities, and to be what we call a good mixer. It is well if he can receive genuine inspiration from real live-wire teachers who have had practical experience in engineering work and who can give him some idea of the problems of the profession beyond the class room.

Thus, with much more breadth of view, engineering education may open the gates of greater responsibilities and usefulness. And these younger men we call engineers will be the leaders of tomorrow and will be recognized by society as educated, cultured, and professional men.

The time must come when political and economic power will be used to promote the general welfare, never for personal or special group advantage.

Annual Report of NSPE's Committee on Education

By Walter H. Wheeler

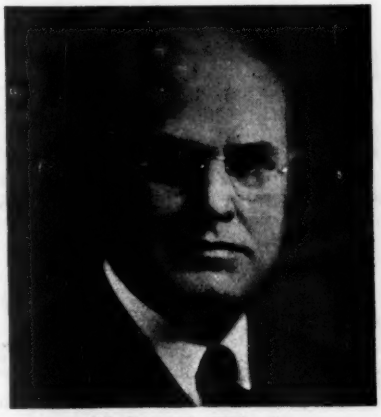
Delivered to the Annual Meeting of the National Society of Professional Engineers, Atlanta, Georgia, December 8, 1946

The formal report of your Committee on Education was submitted to your Board of Directors at their meeting in St. Louis on October 27th, 1946, and approved. Our report to the Board was the result of two years of study by the Committee.

In our report we recommended that all engineering colleges require the equivalent of five years of college work by all students to qualify them for an engineering degree. We further recommend that twenty per cent of the credits shall be acquired in the study of literature, English, writing, public speaking, economics, business administration. history, U. S. Government and its advantages, sociology, psychology, and contract law.

It is quite obvious from our study that there is rather general agreement among the leaders of our profession that engineering graduates in general lack the cultural training that is essential for a well rounded professional career. We believe that the colleges should take the necessary steps to provide that cultural training.

Our investigation indicates that in a good many cases the heads and faculties of engineering colleges would like to adopt such a five year plan but are hesitant to do so unless the public demands it. We believe that if they were assured of the strong backing of the National Society of Professional Engineers it would influence them to do it.



Walter H. Wheeler

We are aware that many young men enter engineering colleges with no thought of practicing the profession. They want to know something about engineering for other reasons. Many students who begin the study of engineering drop out after a year or two because they find that they have made a mistake or feel that they have gone far enough and want to go to work or take up some other line of study. We believe that our Society should be concerned with the education of students who wish to become professional engineers, and that it should exert its influence to raise the standards so that when the student completes his course and receives his degree it will mean that he has received the type of education that will prepare him for a professional career. We do not believe that technical training alone is sufficient preparation at college level.

Your Committee also recommended that the NSPE give prompt consideration to ways and means to expand the proposed five year minimum into a minimum six year program as soon as that can be accomplished. We realize that this will take time.

Our immediate task should be to promote the five year plan and assist in getting it generally adopted. Cornell, Minnesota and Ohio State have already done so, and our information is that it has been well received.

We recommend that copies of our report as approved by your Board of Directors be placed in the hands of the heads of all engineering colleges in the United States as soon as possible.

Professional Engineers Covered By New Labor Bill

By Milton F. Lunch
NSPE's Legislative Analyst

S. 360 Provides Separate Classification for Professional Employees

A bill calling for a "stem to stern revision" of the Wagner Act has been introduced in the 80th Congress by Senator Joseph H. Ball (R., Minn.), which also incorporates several far-reaching changes of great importance to professional engineers, as well as other professional employees.

Senator Ball is spearheading the Republican drive to revise the present laws governing labor-management relations. He had previously introduced three other bills dealing with this subject. The new bill, however, is easily the most provocative and will undoubtedly receive heated discussion, both in Congress and in outside circles.

Virtually no section of the Wagner Act would be left untouched by Senator Ball's proposal. In order to follow the debates on this measure it will be necessary to understand not only the changes directly affecting "professionals," but also the other sections which are intended to effect the drastic overhauling.

Professional Sections

The most important change to professional engineers is an addition to the existing provision concerned with the selection of the appropriate bargaining unit. The Ball Bill states that no unit shall be appropriate for collective bargaining purposes "if such unit includes . . . both professional employees and employees who are not professional employees . . ."

There can be no question that this provision clearly and explicitly rules out the forcing of professional employees into heterogeneous unions for election or bargaining purposes.

Who Is A Professional?

The obvious difficulty in writing any legislation which grants certain rights to "professional employees" is the necessity for defining that term. This same problem was encountered by the Administrator of the Fair Labor Standards Act, which exempts bona fide professional employees. His solution forms the basis for Senator Ball's definition, with certain modifications, additions, and deletions. It will be noted in the following definition that, whereas, the Fair Labor Standards Administrator incorporated a minimum salary test, the definition proposed by Senator Ball makes no such requirement.

Quoting the exact language of the bill, Senator Ball's proposal is as follows:

". . . The term 'professional employee' means —

"(A) any employee engaged in work (i) predominantly intellectual and varied in character as opposed to routine mental, manual, mechanical, or physical work; (ii) involving the consistent exercise of discretion and judgment in its performance; (iii) of such a character that the output produced or the result accomplished cannot be standardized in relation to a given period of time; (iv) requiring knowledge of an advanced type in a field of science or learning customarily acquired by a prolonged course of specialized intellectual instruction and study, as distinguished from a general academic education or from an apprenticeship or from training in the performance of routine, mental, manual, or physical processes; and (v) of a character which, under State or local law, would generally require licensing, certification, or registration of the practitioner, if he made such services available to the public; or

"(B) any employee, who (i) has completed the course of specialized intellectual instruction and study described in clause (iv) of paragraph (A), and (ii) is performing related work under the supervision of a professional person to qualify himself to become a professional employee as defined in paragraph (A)."

It is important to note that under this definition licensing or registration as a professional engineer under a State law will not be sufficient by itself to establish the fact that an employee is a "professional." All of the other requirements must be met and it will necessarily depend upon administrative interpretation to establish in each individual case whether or not a professional engineer meets the test.

The mere fact that an individual holds a license does not sufficiently establish that the work he is doing falls within the legislative intent of covering certain types of employees for labor relations purposes. Therefore, Senator Ball's bill defines the term in expressions of the actual work performed, and indicates that where such work requires State registration, such registration will be further evidence of a Professional employee.

Sub-section (B) will cover the engineer-in-training or pre-professional who fails to meet the requirements of licensing or registration because of the State law demanding a minimum period of experience prior to licensing or registration.

Supervisors Exempt

Another important provision of the Ball bill is that which will remove supervisors from coverage of the Wagner Act. Their removal is complete and unqualified. It should be emphasized that professional employees are not removed from the Act, as are the supervisory employees.

Having stated that supervisors shall not be covered by the Act it becomes important to know what persons are to be considered as supervisors. Senator Ball's definition of a supervisor is as follows:

". . . The term 'supervisor' means any individual having authority, in the interest of the employer —

(A) to hire, transfer, suspend, lay off, recall, promote, discharge, assign, reward or discipline other employees, or to adjust their grievances, or to make reports on employees upon which such action may be based, or to enforce against employees and other persons rules intended to protect the employer's property or the safety or health of persons on the premises; or

"(B) after inspection to accept or reject the work of other employees, or to determine the amount of wages earned by other employees or to apply the factors on the basis of which the wages of other employees are determined, or to make effective recommendations on these subjects."

It is difficult to determine the number of engineer-employees to be exempted from the Act under this definition. Obviously, a large number of engineer-employees will fall somewhere within the test. As an example, however, it would appear that an engineer who assigns jobs to other engineers or to non-engineer employees, even if

he performs no other supervisory functions would be exempt. Likewise, an engineer who must pass approval or disapproval upon certain work by either fellow engineer-employees or non-engineer employees would be exempt.

Strikers Rights Limited

The most controversial section of the Ball bill is that which would, to use Senator Ball's words, give an employer a chance to "beat a strike." This would be accomplished by providing that striking employees would be forbidden to take any further action under the Wagner Act if (1) their employer had hired workers to replace them; or (2) the employer offered to the striking workers an offer to return to work under "substantially equivalent employment." It appears that the reinstatement offer may be made at any time after the strike begins.

The Minnesota solon believes that it is impossible at the present time for an employer to "beat a strike" unless the employer is willing to close down his plant and wait until the workers are "starved" back. "The employers' hands are tied today," Senator Ball states. "This bill gives him a chance to organize a back-to-work movement. The right to strike must be set off by the right to break a strike."

Administrative Changes

The greater part of the NLRB's functions would be transferred to a new Labor Division, to be created in the Department of Justice, under an Assistant Attorney General. The NLRB would be left only the function of conducting hearings and certain administrative duties. The new Justice Department unit would receive complaints, investigate, order hearings, and prosecute cases. Most NLRB employees would be transferred to the Justice Department Labor Division to accomplish this work. The NLRB and the Labor Division would be forbidden to engage in conciliation, mediation, or economic analysis.

Unfair Labor Practices Enlarged

The Ball bill would make it an unfair labor practice for a labor organization or its agents to "interfere with, restrain, or coerce employees in the exercise of the rights guaranteed in Section 7." (Section 7 gives employees the right to self-organization, form, join, or assist labor organizations, bargain collectively through their own representatives, and engage in concerted activities for collective bargaining purposes.)

SIMILAR BILL IN HOUSE

Shortly after the introduction of the Ball Bill in the Senate, Representative Carl Hinshaw (R., Calif.), introduced a bill in the House of Representatives dealing exclusively with the problems of professional employees. Representative Hinshaw, himself an engineer, proposes the same definition of a "professional employee" as does the Ball Bill.

Whereas the Ball Bill would amend the Wagner Act to remove the authorization for the closed shop for all employees, the Hinshaw Bill would leave the proviso authorizing the closed shop intact except for professional employees. This would be accomplished by adding the words, "by persons who are not professional employees," within the closed shop proviso.

Another difference between the two bills is that the Ball Bill amends Section 9 (b) of the Wagner Act to state that no unit shall be appropriate for collective bargaining purposes if "both professional employees and employees who are not professional employees" are included in the same unit. Representative Hinshaw would accomplish substantially the same result by providing "that no professional employee shall be included by the Board in any such unit (or subdivision thereof) unless such unit is composed exclusively of professional employees."

The most important difference between the Senate and House bills is that Senator Ball's measure is a comprehensive plan to amend the Wagner Act in all of its phases and containing some highly controversial points not specifically concerned with professional employees only, while the Hinshaw Bill deals only with professional employees and omits any reference to other changes in the Wagner Act.

The California solon's measure has been numbered H.R. 1754 and has been referred to the House Education and Labor Committee for consideration.

It would also become an unfair labor practice for a union to refuse to bargain collectively with an employer, provided the union is the representative of the employees.

Collective bargaining is clarified to state that such obligation does not compel either party to agree to a proposal or require the making of a counter proposal. The employer is given the right of freedom of speech and may present any statement of views or arguments, either written or oral, unless such statement contains threats of force or economic reprisal.

In line with a previous bill by Senator Ball to outlaw the closed shop (S. 105), his present bill also eliminates the "proviso" in the present law authorizing the closed shop.

Other Changes Noted

To the present provisions that any individual employee or group of employees may present grievances to their employer, Senator Ball would add, "and to adjust such grievances, without the intervention of the bargaining representative, as long as the adjustment does not violate the terms of a collective bargaining contract or agreement then in effect."

In determining appropriate collective bargaining units the Board would be forbidden to declare any unit appropriate if it includes two or more plants, unless separate tabulations have been made of the votes in each such plant and a majority in each plant selects the same representative. Members of crafts, within a plant, would be allowed separate elections to determine whether they wish to be represented by their own craft unit, or by a plant-wide union.

The NLRB would no longer be able to permanently bar an independent union on the grounds that it is a successor to a company-dominated union, under the terms of the proposed law. No election could be directed in any bargaining unit, or sub-division of such unit, if in the preceding twelve-month period a valid election had been held within such a unit.

A much broader court review is provided for anyone who feels aggrieved, of NLRB findings and decisions. A present "sore point" in the present Act provides that the Board's findings shall be conclusive upon the courts "if supported by evidence." Senator Ball would overcome this by requiring that the findings be "supported by the

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NSPE Issues Press Release On Its Stand on New Labor Legislation

The following statement was released by the Washington Office for general publication on January 13th. It states the major objectives of NSPE in implementing the Policy on Labor Laws and Legislation as adopted by the Board of Directors at their October meeting

Following a prolonged period of study of the Wagner Act and its effect upon the professional engineers of the United States, the National Society of Professional Engineers has determined that corrective action through legislation should be adopted by the 80th Congress, it has been announced by the Society.

Other engineering societies have reached the same conclusion and a concerted effort will be made to have the Congress favorably consider amendments to the present law which are necessary to protect the professional engineer against the abuses that have appeared in recent years.

Since the adoption of the Wagner Act it has become increasingly clear that the rights of professional engineers, as well as those of other professional employees, have been considered in the same manner as that of the non-professional employee. In many cases the professional employee has been required to become a union member as a condition of employment, even though as a professional employee his interests, standards of work, and ethics of his profession would best be served through association among fellow professionals, rather than through unionization. The administration of the law has, in many instances, forced groups of professional engineers to become a part of a union composed of divergent elements which did not represent the engineers viewpoint or sympathies.

The Wagner Act did not recognize, as did the Fair Labor Standards Act, that professional employees have particular problems, aspirations, and relations with management, which are apart and distinct from those of other employees. Consequently, professional employees have been denied their traditional freedom of association and mutuality of action.

The NSPE does not wish to deny to any employee the right to associate through unions but does insist that professional employees must be accorded the opportunity of determining whether they will band together among themselves, with other professional groups, or with unions of their free choice to advance their status in accordance with the ethics of their profession.

To support this view NSPE will urge passage of legislation by the Congress to insure certain basic rights to professional employees. Among these rights are:

(1) Full freedom of association or non-association, according to the desires of the individual;

(2) The right in association of determining with which agency to be associated;

(3) The right to restrict such agency exclusively to professional employees where desired by the professional employees;

(4) Freedom to associate and confer with management upon mutual interests and problems without being considered a labor organization, where the professional employees desire that course of action.

NSPE believes that the corrective legislation should clearly state that:

(1) Professional employees shall not be required to be a member of any labor organization as a condition of employment;

(2) That professional employees retain the right to bargain collectively if they so desire;

(3) That professional employees desiring to bargain collectively shall not be required to be a part of an organization not composed of professional employees only;

(4) That no professional employee shall be coerced to be a member of any organization.

In view of the fact that 47 of the 48 States have laws governing registration of engineers, in addition to Hawaii, Alaska, and Puerto Rico, NSPE believes that the basic definition of a professional employee should be the legal test of registration. Other definitive language should include those persons performing work of a professional nature who in due course will become qualified for registration, and those professional persons who are not required by law to register, i.e., chemists, scientists, etc.

It is emphasized that the legislation which NSPE urges will not take away from any professional employee his right to join any labor organization, to retain his present membership in a labor organization, or to associate with any newly formed labor organization composed of professional employees. However, it will insure to him the equal right of not joining an organization or of joining only that organization which, to him, best represents his profession and his interests.

NSPE desires the support of all engineering organizations, and other professional groups, to achieve this reform and will cooperate with such groups to impress upon the Congress the necessity and desirability of this corrective legislation.

The problem (of good government) . . . involves an improvement in human character that will synchronize it with our almost matchless advance in science and all our material and cultural development.—Gen. MacArthur.

Editor,
American Engineer:

The Engineer occupies a unique place in American life; he can have a seat amongst the political mighty for the asking. I fear, however, that, as Dr. Price would say, he must remove the sty from his eye, before he is prepared to accept it.

H. W. Straley, III,
Washington, D. C

Changes in Labor Laws Suggested to Senators By Professional Engineers

Engineering Organizations Present Joint Testimony

The drive of the engineering profession to obtain amendments to the National Labor Relations Act which will protect he interests of professional engineers and enhance the professional status of engineers has been advanced by the presentation of the professional engineers views to the Senate Committee on Labor and Public Welfare on March 4, 1947. The testimony, presented by a panel of representatives of the professional engineering societies in which NSPE participated, follows.

The Official Statement

The several Engineering Societies represented on this panel are professional organizations having a combined membership of about 100,000 individual members distributed throughout the United States and its territories. The membership is composed of both employers and employees and is engaged in a wide variety of fields, including federal and local governments, industrial organizations and private engineering offices.

This statement is directed to some provisions of legislative bill S. 360. It is not intended to discuss broad phases of labor relations. Our comment will be confined to the viewpoint of professional personnel as defined in Sec. 2 of the bill. Wherever the term "non-professional" is used in the following discussion, reference is made to employees whose duties do not fall within this definition.

Due to the character and widespread distribution of our membership, we believe we are in a position to speak with a well-balanced and unbiased viewpoint on these phases of labor legislation affecting the professional man. For a number of years, our Societies, through their Boards of Directors and many of their individual members, have devoted much time to study of interpretations and operations of existing labor laws affecting professional employees. They have endeavored, with regrettably little success, to chart courses of conduct which will permit such employees to enjoy the opportunities apparently intended under provisions of the Wagner Act and to avoid pitfalls into which, from time to time, they have fallen to their detriment. Much space has been given to discussion of the subject in our publications.

As a result of all this, we find that many situations have arisen, and will continue to arise, under present laws where the best interests of professional employees, non-professional employees, and employers alike are not well served.

Confusion and conflict with organizations of non-professional employees have developed. Again, the employer of non-union professional engineering employees has been faced with union picketing of construction projects he has designed. We do not believe these developments to be in accord with the intentions of Congress and certainly they are not in the interest of promoting progressive, cooperative relations between employer and employee, nor for the best good of the country. Modifications of existing labor laws are sorely needed.

In view of the rapid technological developments in American industry, most large scale industrial enterprises today employ large staffs of professional engineers, architects, and scientists on a full time basis. As a result, these professionally trained and professionally minded employees come within the coverage of the National Labor Relations Act. In a lesser degree, the same trend has been occurring in the professions of law and medicine, for it is common to find banking, insurance and manufacturing corporations which have legal departments and medical departments of their own.

The National Labor Relations Act was enacted primarily for the benefit of the unskilled and unorganized worker in mass production industry. Cognizance was taken of the status which the skilled craftsman had attained and special provisions were contained for recognizing craft units. Unfortunately, no corresponding recognition was accorded the special problems of the professional employee.

A fundamental difficulty with the Wagner Act as it affects professional employees is that no distinction is made between professional employees and non-professional employees in spite of the fact that their viewpoints and abilities are inherently different and their conditions of employment cannot be made subject to a common standard.

Professional services are predominantly intellectual and are varied in character. Constant demand exists for originality and creative thought in the solution of problems presented with each new undertaking. Technical skill is only a part of the equipment of a professional person. There is no yardstick by which creative ability can be measured. Individual talents vary and every person possessing a professional attitude constantly strives to expand his knowledge and improve his abilities in his chosen field to the end of personal excellence, personal advancement and the betterment of his profession. Regimentation of professional employees is incompatible with the maintenance of true professional standards. Any law can be used to restrict individual professional effort hinders and restrains professional development.

With relation to conditions of employment, consider the typical situation of a professional employee in a large industrial plant. The duties of one engaged in the development of industrial processes or the design of equipment may be such as to demand continuous and prolonged application of his individual services. From the very nature of those services, the employee must be granted prerogatives such as access to various portions of

the plant at all hours, the right to work with continuing shifts as occasion may demand, latitude as to hours and location of employment, and freedom of judgment as to the best method of carrying out his special assignment. Obviously, such working conditions cannot be set forh in the usual labor union type of contract.

To attempt application of the same standard of measurement for services of professional men and non-professional men is not in the public interest. The output of professional employees cannot be standardized as can that of manual and skilled labor. It cannot be measured in terms such as the number of brick a man should lay in a given number of hours, the number of cubic yards of dirt that should be moved, the square yards of painting, the amount of type to be set, bolts to be placed, feet of conduit to be laid, or in terms of any other similar unit.

The production output of the professional man is largely that of his mind, while that of the non-professional depends largely on his manual skill and dexterity. No law by which professional employees and those engaged in routine, mental, mechanical and physical work must conform to the same regulatory pattern is a just law. It is unjust alike to the laborer, to the non-professional white-collar worker, to the professional man, to their employers and to society.

Although professional employees have found themselves mixed up in collective bargaining problems generally without desire on their part, and frequently in spite of their protests, we accept the principle of collective bargaining as a right of all employees, professional and non-professional. We do not believe that any professional employee should be required to belong to any organization as a condition governing his employment.

The background, education, training and work interests of professional employees and non-professional employees are inherently divergent. It is futile to expect that a *forced* grouping of the professional and non-professional employees in any plant or organization could possibly form an "appropriate bargaining unit". Under present law and its administration, such plainly inappropriate groupings are made and, by fiat, are declared appropriate. We do not consider this to have been the intent of Congress.

Some groups of professional employees have been recognized as appropriate bargaining units under existing laws, but usually such recognition has been accomplished only after long and costly controversy, entailing litigation and appeal and fundamental disturbance of employer-employee relationships. Frequently, however, professional employees have been grouped arbitrarily in heterogeneous bargaining units. In such cases the professional employees are usually a small minority in a large bargaining unit or trade union local, the majority of whose members have no community of thought or interest with professional employees. We believe that the law should be made so clear and explicit with regard to this matter as to eliminate the possibility of such groupings.

Consideration by your Committee is directed to three specific points which we believe are of fundamental importance for inclusion in any legislation which establishes standards for collective bargaining between employees and employer, viz:—

(1) Any group of professional employees, who have a community of interest and who wish to bargain collectively, should be guaranteed the right to form and administer their own bargaining unit and be permitted free choice of their representatives to negotiate with their employer.

(2) No professional employee, or group of professional employees, desiring to undertake collective bargaining with an employer, should be forced to affiliate with, or become members of, any bargaining group which includes non-professional employees, or to submit to representation by such a heterogeneous group or its designated agents.

(3) No professional employee should be forced, against his desires, to join any labor organization as a condition of his employment or to sacrifice his right to individual, personal relations with his employer in matters of employment conditions.

Legislation which would cover these three points, and cover them without possibility of contrary interpretation, would satisfy one of the avowed purposes of the present National Labor Relations Act. It is proclaimed in Section 1 of the Act that one of its purposes is:

> "to protect the exercise by workers of full freedom of association, self-organization, and designation of representatives of their own choosing, for the purpose of negotiating the terms and conditions of their employment or other mutual aid and protection."

So far as professional employees are concerned, administration of the Wagner Act often is completely contrary to the avowed purpose above quoted. The "freedom" of association and choice so properly proclaimed in the Act frequently proves in fact to be but an empty promise to professional employees.

We believe that provisions of S. 360 meet the foregoing objectives.

In Sec. 2, there is included a definition of the term "professional employee" which seems to us adequate as a standard for determining those professional employees in any place of employment who have a community of interest by reason of the character of their duties. Employees who meet the criteria established here cannot be expected to find their needs and desires in dealing with an employer satisfactorily met unless they can negotiate in their own behalf and without interference from those who have little, or no, appreciation of the character of their services or of their objectives.

We wish to emphasize the language used in sub-paragraph (B) of the definition. This has reference to the employee who may be considered as a junior professional—the young man who has acquired the necessary educational background for a professional career and who is performing services of an elementary professional nature under the supervision of a profesional person to qualify himself as a full-fledged professional. Young men of this type have been especially vulnerable to the evils mentioned above. They stand in particular need of the protection to be gained from the amendments we advocate.

Sub-clause "(B)" appearing at lines 6 and 7 on page 10 of S. 360, as a part of Sec. 9(b), would prohibit "both professional employees and employees who are not professional employees" from being included arbitrarily in any unit for the purpose of collective bargaining. This should guarantee to professional employees the privileges included in our recommendations (1) and (2) as outlined above. The amendment not only permits a professional employee to join a labor union if he desires but also

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Thoughts on Technical Education

By Francis J. Curtis

Vice-President Monsanto Chemical Company

An Address delivered June 15, 1946, at the Eighteenth Biennial Conclave, Alpha Chi Sigma. Reprinted from "The Hexagon of Alpha Chi Sigma" with the kind permission of Its Editor and The Author.

We hear much nowadays of consumer research and of the vagaries of that peculiar individual, the customer. Business devotes much time and organization to find out exactly what the customer wants and how his tastes are changing. Rarely do we hear the cry of twenty-five years ago, "Why don't you sell what we can produce?" Time and effort have changed the slogan to, "The customer is always right." Hence this discussion is based entirely on the viewpoint of the consumer of the product of technical education and necessarily the consumer in the chemical industry. It is obvious that not all of the products of technical education go into the chemical industry and my remarks do apply only to those who do.

We must not make the mistake of thinking that all technical education is obtained in the college or university. The home and the secondary school previous to college and the industrial organization after, all have a part to play. If any one of these fails, the product is lopsided. Furthermore, education is never finished in a real sense of the word, though many individuals cease learning at a very early age. In fact, it might be considered the primary duty of the educational process to see that it itself does not cease in the individual.

What Are We Aiming At?

One cannot start a synthesis without knowing clearly what product is wanted. Hence before laying down the course of a technical education, we should first try to decide what we want to end up with. While there are all sorts of gradations between them, the two major schools of thought seem to consist of those who on the one hand would try to produce the best all around man for living, and on the other give the best training to enable the man to earn the most money in the shortest time. The first does not necessarily rule out training for a vocation, but it does not exalt such training above all else, especially above the character formation. Vocational training is obviously the simplest and in my opinion is what most chemists and chemical engineers have received.

One of the difficulties in technical education is that it is very hard for the educator to measure the success of his process. Contrary to industrial chemical manufacture, it is not possible to set up standard yields and specifications by which the product can be exactly measured before it leaves the plant and while there is some contact after leaving the university, it is usually of a very loose type. I am not conscious of ever receiving requests for reports from any professor on the accomplishments of the men whom they have sent to us, other than casual questions at a chemical society meeting. In other words, there is not the systematic checkup on the results of the process of technical education that we are used to in the case of the products of industrial chemical manufacture. I believe it would be very profitable for universities to introduce this type of self-criticism. Maybe industrial employers should complain to the universities when the products of the latter do not turn out to be satisfactory. They certainly show no hesitancy in making a fuss over defects in material products.

Science with its emphasis only on the measurable and its great accomplishments in physical matters, after having thrown out religion in a large fraction of the western world, has had no character formers to put in its place. If only the material exists and there is only the here and the now, it is rather a simple deduction that one should make the most of it without scruple or hindrance or consideration for others. Hence the emphasis on vocational education to make the most money in the shortest time with the least effort, and the lag in the social sciences of which we hear so much.

If Individual Won't, State Must

When the individual will not police himself the state must do it for him. Hence the growth of autocracy, authoritarianism, or totalitarianism, or whatever you want to call it, in the last fifty years. A half a century ago much of Europe was under constitutional monarchy, in practice, nearly equal to a republic, and even in Russia, the government being less efficient, allowed more freedom. Today even in the British Empire and the United States, the individual is beginning to lose to statism and in nearly all the other countries he has definitely lost. Whether one calls the regime socialism, communism, naziism, or what, it does not matter. We are talking about the exaltation of the state at the expense of the individual. One of the things to which we should be very much alive is that when freedom is lost by one segment of the population, that loss is felt by all. Much of the freedom of business has been lost in the last thirty years. I venture to prophesy that labor will lose much of its freedom in the next. It is important to work to preserve the other fellow's freedom if we are going to have our own.

In my opinion the only solution is education for character in its broadest sense, of which vocational training will be a subsidiary part. So we set emphasis on the whole man as being greater than the sum of his parts, as

the point of view from which to approach his education, technical or otherwise. That is what we are aiming for.

Analysis Has Beaten Out Synthesis

The conclusion above is quite contrary to the principle we all learned in our scientific training, namely, that the whole is equal to the sum of its parts. What we are saying is that the immaterial does exist. Based on the theory that the whole is equal to the sum of its parts, chemical engineering, for example, has been subdivided into a series of unit processes, possibly the most damaging conception that could have been made. Based on this theory, chemistry has been split into organic, inorganic, physical, biological, analytical, and so forth, ad nauseam. We have chemists who will only make compounds as an end in themselves and cannot be bothered with practical processes to manufacture them or application to use them. We have chemical engineers who will not do laboratory work, chemists who will not do pilot plant work. Soon we expect to have engineers who will work only on filtrations, others only on heat transfer, and so forth. The technical man is becoming a worker on an assembly line, and sees only Bolt No. 452 or Rivet No. 674. Any man who will of his own accord only carry out a piece of the process between the idea and final manufacture or application of a product, is a condemnation of himself and his education.

Courses have been standardized and accrediting systems set up. Woe to the university that does not have the exact number of required hours given by the specified types of teachers.

What Can Be Done?

We seem to have lost sight of synthesis in a morass of analysis. We have knocked Humpty-Dumpty off the wall and broken him into pieces to find out what he is made of, and we, too, do not seem to have been successful in putting Humpty-Dumpty together again. What can be done about it?

After studying and interviewing many hundreds of technical graduates in the last ten years, I am quite convinced that as the students are, so are the professors. The students reflect far more than the latter would probably wish, the professor's whole point of view on not only technical matters but life. The professors and the instructors are far more important and should receive far more attention from the management of a university than laboratories, buildings, football teams, stadiums, libraries, and so forth. By logical deduction the troubles in technical education are due, therefore, to the professors, and the problem must be tackled at this point. It seems to me that the teaching staff must cease to emphasize the importance of units of processing or investigation and must stress the whole, teaching men to carry on from beginning to end. This spiritual change is far more important than any changes in curricula which in themselves are reasonably satisfactory.

A Spiritual Sin

Spiritual pride is the deadliest of the deadly sins. The exploratory chemist is no more important than the process man, the chemical engineer, or the application technician. They all are parts of a whole which will not function without them and the whole is in itself more important than any of its constituent parts. No man should get a degree who has not shown that he can put together all of the bits he has learned into an organic whole.

There are a number of movements in this direction among the universities of late years. We have gone through the stages from the completely inflexible course system to the completely flexible, and now seem to be settling down in a combination of the two where certain requirements are made for specialization, others for distribution, and at least a modicum for absolutely free choice. Tutorial or preceptorial systems have been developed whereby the man gets individual attention by a tutor who is in a position to treat him as an individual and a human being, to discuss his particular problems in a way that cannot be handled by lecture, laboratory, or classroom methods. Many universities are requiring before granting a degree, an overall examination on the field of study to make sure that something more than a dry wall which will tumble down on slight external pressure, has been built. Finally I believe that each man should have to do an undergraduate thesis of some sort. A chemist should have done a piece of research no matter how small and a chemical engineer figured out a whole process no matter how simple. All of these are in effect in some institutions and point the way in the direction we are aiming. It is to be hoped that their use will become more universal, even if some of the teaching of excessive quantities of facts have to be left out.

We all know the old cry that the universities should stick to fundamentals. It is hopeless to equip each man for every possible job he may obtain. It is the prime purpose of the university to inspire the desire to know and to show how to learn. If there is time beyond that, the man should be taught the more basic principles, leaving the application to be learned later.

Adopting this principle puts a burden of education on industry, of which it is by no means sufficiently conscious. As a matter of fact, it is usually the industrialist who makes the statement about fundamentals, and if he really believes what he says he must be prepared to carry on and instruct in the details. I am afraid there is an opinion among the industrialists that they are getting a finished product from the universities. Nothing could be further from the truth and that is no reflection on the university. In a very large fraction of industry the obligation to continue education is never considered.

Here again we have a spiritual problem. It so happens that most of the men now in the upper levels in industry were brought up at a time when the sink or swim principle was in vogue. Call it rugged individualism if you like, but each man was left to develop and push himself with a minimum of outside help or interference. Most of the men who got to the top got there by that method. Hence they are quite unsympathetic with the view of the newer generation which has had the idea subtly instilled into it that the world or something owes them a living and that they shouldn't have to work too hard about it. This is part of the world trend towards statism, in the broad sense that the individual feels that somebody else should take care of him rather than he himself alone. He has given up his freedom for the traditional mess of pottage. However, these problems must be met if we are to complement the universities and if they are to stick to character forming and fundamentals as we so often tell them.

The first question that arises is that of formal training courses and the arguments pro and con will probably go on forever. Personally I do not feel that you have to have a formal class to have education go on. One of the most important things that an industrial con-

cern has to teach is judgment and judgment cannot be learned from a book. It must be learned from making judgments, seeing them fail, picking up the pieces, and learning from the process to do a better job the next time. Any training course completely flops in this field because by definition a trainee has no responsibility.

I believe that on-the-job training is probably the best, with as much movement from job to job as possible, consistent with not too much upsetting of operations and definitely more than the operating men would like to have.

Seminars, regularly held with active participation by all the members, are an excellent means of training, not only in the preparation of the subject but in the acquiring of ability in public speaking, and quick thinking in answering questions and countering arguments. There is also a great value in the seminar system in bringing in from outside the company, distinguished speakers who are authorities in their fields. This not only brings the technical man up to date in a particular field, but also enables him to increase his acquaintances among prominent men in his profession. Attendance at technical meetings should be definitely encouraged, preferably on a known rotational system so that no one is forgotten and that each knows when and where he is to go. Trips to technical meetings out of the regular turn make excellent rewards for outstanding pieces of work. Technical men should be encouraged to give papers. This seems to be considered something that they all want to do. As a matter of fact my experience is that you have to do a lot of kicking at them to get them to even consider writing a paper. This is probably not true in the university circles where publicity is the breath of life, but with all the good will of the management in the world, we find it very difficult to get the technical men to really buckle down and go to the bother of writing and giving technical papers.

I am a strong advisor of extending the tutorial system to industry. I believe that each younger man ought to be assigned to an older technical man of sympathetic bent, one not his immediate superior. To this man he can bring his difficulties and troubles, his questions, and his gripes. Even the ability to tell about them helps.

Finally, I am strongly in favor of leaves of absence for technical men to return to universities for further advanced study. This applies not only to those who might wish to work for advanced degrees but even to those of older standing who may be in a rut or need refresher courses. Here again it is obvious that leaves of absence of this type can be made a much-sought-after reward, and even if only a few are available per year the rise in morale will be very apparent.

Undoubtedly there are other ways in which industries can carry on technical education and more will be devised from time to time. The thing we have to insist on is the recognition of the necessity of picking up the burden. If we can accomplish this spiritual objective the material things will easily follow.

Conclusion

The fundamental tenet of science that it is concerned only with the material and the measurable has created a lopsided world. The social sciences and religion dealing partly with the material and partly with immaterial criteria, blinded by the accomplishments of the physical sciences, have tried to become measurable and have emasculated themselves. The trouble with our education is not physical but spiritual. We need to achieve a belief in the greater importance of the whole than of any of the separate parts, in the greater importance of character than of knowledge and of fundamentals than of individual facts. Then on this belief we must act.

Professional Engineers Covered by New Labor Bill

(*Continued From Page 7*)

weight of the evidence."

Unlawful Strikes Forbidden

Strikes to compel employers to bargain with a union not certified by the NLRB as the appropriate bargaining agency; organizational strikes, strikes to remedy situations for which there is an administrative remedy in the law; and strikes to force an employer to break the law, would be deemed an unlawful strike and would remove the protection of the Act from persons taking such illegal action. Another penalty is provided in these cases by redefining such actions as not being "disputes" under the Norris-LaGuardia Act. Thus, courts could enjoin these illegal activities.

In a later section of his bill Senator Ball provides that supervisors would be free to join labor organizations but employers would not be required to engage in collective bargaining as regards the supervisors.

To meet the contentions that employers have been bound by action which they did not authorize or sanction the present definition of "employer," which now includes persons "acting in the interest of an employer, directly or indirectly," would be changed to provide that an employer is any person "acting as an agent of an employer."

Under the present law an employer may petition for an election only when two or more unions are seeking to become the sole bargaining agent. The Ball bill would give employers this right in any cases where they feel a representation question is involved.

(NOTE—Copies of Senator Ball's bill (S. 360) may be obtained by writing to your Representative or one of your Senators. The NSPE Washington Office has not been able to obtain this bill in any quantity due to the large demand for it.)

I want to be free from tyranny so that I can be virtuous simply because it gives me pleasure to do what is right.
—Epicurus.

Religion has been described as the "moral and intellectual regeneration of humanity, wrapped up in discipline and expressed in service.

A great philosopher once said: "Some people go through life without perceiving the truth any more than the spoon tastes the soup.

Science asks not why, but how. Why implies purpose, philosophical bookkeeping. How requires an explanation.

There is little hope in the present for a man or a nation which rejects the truth because it is not palatable. Facts are often disturbing to those who are unable or unwilling to adjust their thinking to the implications involved.

Too many fanatics take pride in their dogmatic faiths, and testify to the virtue of their truths by breaking heads.

Letters From Readers

Editor, THE AMERICAN ENGINEER.

The perrennial questions comes up again. Who is entitled to reciprocity? Can a Land Surveyor perform Engineering functions? May a Civil Engineer perform the duties of a Structural Engineer and vice versa? etc. etc.

Having been a close student of these situations for over twenty years I have formed a few opinions and I believe that they have crystalized sufficiently to pass on to those who may be in position to use them. It will be noted that a few concessions will have to be made in order to cut the 'Gordian Knot' but having once and finally been made, no other concessions will be necessary.

1: In order to be recognized as a professional man the Engineer must conduct himself as such and, like the M.D., insist that others pay him the deference due his status. We must stop using the designation registered Engineer, as this couples in the lay mind with registered plumber, registered nurse, registered beautician, etc., and use merely C.E., M.E., E.E. etc. For those who did not acquire college degrees but have been licensed we should adopt the European system of conferring the degree with the certificate. The term Engineer-in-training should become as familiar to the lay mind as the title interne and young student should leave school with as much respect for the Engineer as the medical student does for the M.D. and conduct himself accordingly.

2: Our State laws should be uniform to the letter and should specifically state that Surveyors, C.E.'s M.E.'s, E.E.'s, etc. are separate and distinct and that one license does not permit doing any part of the other's work and border lines should be defined in detail. (In some states Surveyors and C.E.'s, are accepted as being the same to the detriment of the Engineers and C.E., Structural and Architectural Engineering functions are permitted to overlap). One thought is that Civil Engineers should be recognized as ipso facto Surveyors but definitely Surveyors should not be recognized as Civil Engineers. (All Surgeons are M.D.'s but all M.D.'s are not Surgeons.)

3: When an Engineer is registered in his home State either by examination or by the 'Grandfather clause' he should be allowed to reciprocate with any State of similar standard by merely applying. (My study has shown that incompetents and the older 'grandfather clause' Engineers do not migrate in sufficient numbers to constitute a problem anyway and along State borders the condition is no different than if they lived in the center of the State except that they have to pay for more certificates.)

4: Whenever several State Departments have enabling acts passed to authorize surveying and engineering work to be done within the State instead of the phrase "shall employ a registered Architect, Engineer or Surveyor, etc." (enabling them to employ the cheaper) some phrase referring them to the registration law should be used.

5: Each State Society of Professional Engineers should have an active, vigorous Committee on Legislation and Enforcement and prosecute each violation to the bitter end especially where it involves elected or appointed Commissioners, Supervisors, Superintendents etc. who want the Engineer to survey while they in their usually incompetent manner attempt the design and supervision. Among ourselves we should have a committee on ethics, fees and salaries and wipe out unethical practice and unfair competition (such as selling a ditch survey as a drainage design project at one-third the fair fee) even if it becomes necessary to request the State to revoke the license of the offender.

6: Each registered Engineer should be required to attend a series of 'refresher lectures' at some recognized school at least once in every three or four years or before his certificate is renewed. It is believed that this alone would be a great step forward.

7: The vicious habit of making an engineer wait until a project is completed before he can collect his money should be stamped out as it is primarily responsible for the fact that we are becoming a caste of salaried technicians rather than a profession of free men. Doctors and Lawyers get their fees 'right now', so should we, especially from taxing bodies and political subdivisions.

8: The general attitude throughout the profession (even in the Professional Societies) of "Let's wait until we are a little stronger before we act," MUST be changed to DO IT NOW. I've listened to the other for twenty-five years. If we are to have an omelet we must break some egg shells. Let's start breaking.

Very truly yours,
John P. Goggin, C.E.,
Clare, Michigan.

Editor,
The American Engineer:

Mr. Shults' specific proposals for improving the lot of humanity, which was printed in the October, 1946, American Engineer, are not to be ignored. However, the "Engineering Approach" in the matter of planning for technological growth must be very careful not to acquire a reputation for spawning a "Noble Experiment" of the type of recent unsung memory.

If short term stock trading is strictly non-functional gambling, the gamble could be replaced by a sure loss by applying a gambling tax on such sales. That is the absolute maximum length to which the law should go in such matters. Such treatment of the matter is similar to a proposal I made in 1943 to have periodic building examinations to determine the tax rate to be applied to every structure in proportion to the hazard it presents to the community and to the community expense it necessitates for protection against the hazard. This would provide an economic urge for modernization.

While on the subject of housing, a worthwhile provision in building codes would be the requirement that every new unit of habitation be provided with

(*Continued on Page 22*)

Registration—A Human Story

By D. B. Steinman
Chairman, New York State Board of Examiners of Professional Engineers

I want to tell you a little story. It is about Engineering Registration—but it is also a human story. You know the kind I mean—one that makes you feel kindlier toward your fellow men. Perhaps it may be classified under that proposed new field of engineering study — "Thermo-Humanics" — the study of the feelings and emotions that actuate human conduct and govern human relations.

I happen to be a member of a State Board of Engineering Examiners. My office is an open house to those who need advice or assistance, and I have a constant stream of applicants, young and old, coming to me with their problems.

One day an older man called on me. He timidly introduced himself, and told me he had come to ask a great favor of me. He was a plumber by trade, located in a small town up the Hudson. He had come to America (from Germany) in his youth, and his one regret was that he had never had a professional education. All of his ambition was now concentrated on his son. The father had struggled and sacrificed to give his boy what he himself had missed—an engineering education. The young man had graduated from one of the best engineering schools in the state and was now content with the job he had been holding for six or seven years in a large industrial corporation. But the father was not satisfied. He wanted to see his son a full-fledged member of the profession—legally qualified and recognized as a Professional Engineer and taking his part in professional organizations. He had urged his son to file the application and to take the examinations, but the young man had seen a sample set of the examination questions and declared it was hopeless. He had grown rusty in the subjects he had studied at college. "I do not know what to do," the father said to me. "I have offered my boy a thousand dollars if he will become a registered Engineer. Can you help me?"

I suggested that some excuse be found to get the son to call on me, and promised that I would do what I could to overcome the young man's fear of the examinations. A few weeks later the son came to me. I explained the procedure, I encouraged him, I suggested refresher courses. He replied that he had a wife and child, that his home was far from his work, that he had to spend hours each day commuting, and he did not see how he could find the time to do the necessary studying. I finally prevailed on him to make the attempt. He filed his application, enrolled in some evening refresher courses, and studied. When the examinations came along, he bravely took them. Subsequently the father called on me and proudly told me that his son had passed *one* of the examinations, although he had failed in the other two. Under the rules, he had to repeat all three examinations, but with this initial encouragement the youth studied harder and tried again. This time he succeeded in passing *two* of the examinations, and had to repeat only the third.

D. B. Steinman

Another half-year passed, and the young man took the third examination over again. Some weeks later, the anxious father telephoned me. "When will the results of the examination be announced?" he asked. I looked up the records and then (possibly breaking a departmental rule) I told the father the good news. His son had received a grade of 94 per cent in the examination. The man was so overcome with pride and happiness that his voice failed him. He hastened to tell his son.

Later the father called on me. Could I possibly tell him what marks the boy had received in the two examinations he had previously passed? I do not know why this information is not given to the candidates. Again possibly breaking a rule, I looked up the records and, to my own delight, I found that the young man had received the exceptionally high grades of 90 per cent and 96 per cent in the other examinations. I congratulated the father. I congratulated the son. His lack of self-confidence had certainly not been warranted. I found my satisfaction in what I saw in the two faces —pride and fulfillment in the father, and a new-born confidence and ambition in the son.

When the young engineer received his professional certificate, the happy father wrote me. Would I join him and his son in a little celebration? I could select the restaurant and he did not care how much the luncheon would cost him. We had our little feast of rejoicing. The father knew that I shared in his happiness.

Two months later the young engineer called at my office. I was away. He left word for me—the sad news that his father had died.

"But tell Dr. Steinman," he said, "that my father was made happy by knowing that I had gotten my P.E. license before he died. I am glad I gave him that happiness."

Yes, there is a human side to the work of Engineering Registration.

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Kindly report any errors or omissions to the Editor

National and State Society News

News From the Washington Office

While the rate of increase in membership of the National Society showed a slight decline we can still report that the membership is growing showing an increase of 235 members during the month of January and a total of 14,322 as of February 1.

Paul H. Robbins

It is interesting to note that at least 6 states in which no Member State Society now exists are actively discussing the possibilities of affiliation of a professional engineers society with the National Society of Professional Engineers. It is hoped that before the year's end that geographical distribution of NSPE Member State Societies will have increased considerably.

Since the 80th Congress convened on January 3, much legislation has been proposed. The re-organization of the congressional activity took a goodly portion of the month of January but the congressional committee are now becoming active in the consideration of the legislation which had been presented for their consideration. NSPE has been active in following this legislation and a series of Legislativee Bulletins have been issued.

Of most importance to the engineering profession have been those bills introduced in connection with labor legislation. These have been analyzed in detail in the Legislative Bulletins and an anlysis of the Ball Bill directly affecting professional employees will be found elsewhere in this issue of the American Engineer. There has been active cooperation between NSPE and other professional societies in the formulation of this legislation together with the preparation of testimony which was given to the legislative committees. This testimony will be carried in the American Engineer in future issue.

The Executive Committee met on January 25th in the Washington office. They were happy to have as their guest at luncheon Senator George W. Malone who is a registered professional engineer from the State of Nevada. The engineering profession can well be proud of the presence of Senator Malone in the consideration of national legislation.

The Washington office has been glad to welcome a number of visitors of the Society during the past few weeks. It is hoped that we may have the opportunity of greeting other members of the Society on their visits to Washington.

We are happy to report that Colonel M. J. Blew, Chairman of the Extension Committee of NSPE has received his discharge from the service and is now located in Washington in a civilian capacity with the Office of the Chief of Engineers, Water & Sewage Section.

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53 Percent Reply in Survey of Profession

Tabulation of 47,272 usable questionnaires return in the 1946 survey of the engineering profession conducted by Engineers Joint Council is under way in Washington, D. C., according to word received from Andrew Fraser, consultant acting for EJC in liaison with the U. S. Department of Labor's Bureau of Labor Statistics. The returns are from the 86,900 members of the six leading engineering societies who received questionnaires, and represent slightly more than 53 per cent of the total number of questionnaires sent out.

Preparatory to compilation of a report based on the replies which will center to a great degree on the economic status of the engineer. Mr. Fraser has made a preliminary analysis which indicates that 12 per cent of the professional engineers in the country were in the Armed Forces some time during the period 1939-1946, and that in general the Services used the special skills of professional engineers to a high degree.

NSPE has cooperated in the survey with representatives of the Societies composing the Engineers' Joint Council. The Committee conducting the survey is a sub-committee of the EJC studying the economic status of the engineer.

Cooperation of the Bureau of Labor Statistics was enlisted in the interest of economy, the Bureau being equipped to take care of the type of pre-coded questionnaire which was used.

Advocates General Engineering Society

The Editor of the "MILITARY ENGINEER," Journal of the Society of Military Engineers, has this to say about the importance of an over-all engineering society embracing all branches of the engineering profession: "We are strongly of the opinion that it is definitely *in the interests of national defense* (one of the objects of our society) that engineers should organize, and that they should take a more active part, both as a group and individually, in American social, political and eonomic activities. In this era when the interests of our nation and of the welfare (and possibly of the lives) of our people, depend on the proper use of the power developed, installed, and used by engineers, it is highly inadvisable to leave the direction of federal, state, and municipal affairs to those who have no understanding of engineering."

Coming Events To Remember

National Meetings

July 11. State Secretaries Conference, Statler Hotel, Washington, D. C.

July 12. NSPE Board of Directors Meeting, Statler Hotel, Washington, D. C.

State Meetings

March 20-22, Ohio Society of Professional Engineers Annual Convention, Deshler Wallick Hotel, Columbus, Ohio.

April 11-12, Annual Convention of the New Jersey Society of Professional Engineers, at the Essex House, Newark, N. J.

May 2-3, 20th Annual Convention, New York State Society of Professional Engineers, Hotel New Yorker, New York, N. Y.

Montana Engineers to Initiate Registration Law

A committee of Civil Engineers is preparing a draft of a bill to be proposed before the 1947 meeting of the Montana State Legislature. According to reports the proposed bill would require the licensing of civil engineers and land surveyors only. Montana is one of two remaining states which do not at present require the registration of any type of engineers.

First Engineer-in-Training Society is Organized in New York State

Under the sponsorship of the New York State Society of Professional Engineers, an organizational meeting of the New York State Society of Engineers-in-Training was held in Grand Central Terminal, New York City, on Thursday evening, January 30. Presided over by Dr. John C. Riedel, chairman, the following members of the Engineers-in-Training Committee of the professional society also were present: Drs. Arthur V. Sheridan, David B. Steinman and Frederick H. Zurmuhlen. Also representing the professional engineers were Charles W. Burke, president, NYSSPE; George J. Nicastro, New York County Chapter; and Frank J. G. Duck, executive secretary, NYSSPE. A total of 34 engineers-in-training attended in response to invitations extended to all those for whom addresses were available.

The idea of an engineers-in-training organization had its inception some six years ago when Dr. Zurmuhlen was present of the State Society. In cooperation with Joseph T. Houlihan, Jr., the Society not only originated the designation "engineers-in-training" but also effected a change in the Education Law through which it was possible for a graduate to take the examination for professional license in two parts. Because of the interruption of World War II, further steps toward the development of a society for young engineers were deferred until the middle of last year.

The Engineers-in-Training Committee of the State Society drafted a tentative constitution which was submitted to the organizational meeting as a basis on which to establish a final constitution. It was made clear that the new society will completely control its own activities. Although a minority of its executive board will be professional engineers, their only function will be to give guidance and advice.

Among the objectives of the new organization are:

1. The promotion of the status of the Engineer-in-Training to that of Professional Engineer in accordance with the provisions of the laws of the State of New York.

2. The dissemination to both public and profession of information relevant to the Engineer-in-Training.

3. The establishment of Rules of Conduct for the Engineer-in-Training.

4. The protection of the designation Engineer-in-Training against improper use.

5. The development of a closs association with the New York State Society of Professional Engineers and the furtherance of mutual aspirations.

Following adoption of a motion that those present form an organization to be known as "The New York State Society of Engineers-in-Training", and that it accept the proffered sponsorship of the New York State Society of Professional Engineers, a steering committee of 14 volunteers was appointed to select nominees for office, to study the proposed constitution and to draw up a set of by-laws.

The second general meeting of the new society was held in Room 5928, Grand Central Terminal, at 7 P.M., on February 13.

Engineers' Associations Discussed

Advantages and pitfalls of union as well as non-union types of Associations explained at N. Y. Chapter meeting.

"After a year's careful consideration we decided to avoid formal unionization", explained Mr. Clark W. Ransom, head of the General Electric Company Engineers' Association at a discussion meeting and lecture of the New York County Chapter of the Society of Professional Engineers, January 14.

The principal reason for this decision said Mr. Ransom was that unionization would make it impossible for supervisory as well as subordinate engineers to act in concert. He explained further that since the Wagner act defined a union as any organization which bargained collectively with management, the ascociation found it impossible to enter into direct negotiations with management concerning salaries or working conditions.

To get around this, Mr. Ransom explained that the Association follows the practice of appointing a committee to study a personnel policy and write a report thereon. This report is then distributed to all interested persons included members of the managerial staff. The latter, if inclined to take the matter up, calls a divisional meeting for purposes of discussion. He gave several instances of the excellent functioning of the policy.

In the question period following, some of the members of the audience charged that the result was a union by subterfuge and that it only worked due to management cooperation.

Mr. Lerov A. Nettleton, one of the founders and Mr. George Metz, President of the recently formed Consolidated Edison Engineers' Association explained the steps leading to its inception and the legal difficulties encountered at NLRB hearings.

After the lectures, Messrs. Ransom, Nettleton, Metz and Walter Magiello, the latter expert on labor relations law, were formed into a panel to answer questions from the floor.

DISTRICT OF COLUMBIA

The District Society is putting forth strenuous efforts to gain support for a Registration Act for the District of Columbia. It is urged that all members contact their friends here and ask that they have their various engineering societies support a registration bill for D. C. It is a matter of deep concern, not only to D. C. engineers, but to engineers everywhere that the Nation's Capital is without a registration law, solely due to the inability of the various engineering societies to agree on such action.

New application blanks for membership in the District Society are now being distributed.

At the February meeting the District Society initiated a "Ladies Night," with added features which included a musical program, as well as other entertainment. There were the usual refreshments. Commander James C. O'Brien, Executive Officer of the National Scientific Roster, was the principal speaker.

Amendments Proposed to New Yorks Engineer's Law

Five proposed amendments to the Engineer's Law, sponsored by the profession, are scheduled for early introduction at the current session of the New York State Legislature at Albany. These amendments have been drafted by the State Society of Professional Engineers in consultation with the State Board of Examiners, the State Education Department, and the Attorney General, and have been endorsed by the New York State Joint Committee of Local Sections of the Am. Soc. C. E. and by other cooperating professional organizations.

The first two amendments listed below have been made urgently necessary by recent developments. A committee of the State Legislature that has been making a study of the statutes for recodification has ruled that two important clauses in our law are invalidated by another paragraph in the same section of the law. The two clauses in question are the "15-year clause" and the "interstate endorsement clause." Both of these clauses are regarded as essential for fair, sensible, and courteous administration of the law; and their revalidation by prompt amendment is necessary.

The five proposed amendments are as follows:

1. *To revalidate the* 15*-year clause.*—This clause permits the Department, on the recommendation of the Board of Examiners, to waive the written examinations in the cases of applicants who are possessed of long established and recognized standing in the profession, who have practiced lawfully for more than fifteen years since graduation. This clause has been in the New York State law for fifteen years, is regarded as necessary and desirable, and now needs to be revalidated. The Model Law, endorsed by all the leading engineering societies, contains a similar provision, requiring only 12 years of experience. Practically all other states have a similar provision in their laws.

2. *To revalidate the interstate endorsement clause.*—This clause permits the Department, on the recommendation of the Board of Examiners, to grant registration by endorsement (without re-examination) in the cases of applicants who are legally registered in other states (and who have passed equivalent written examinations in these other states) provided the applicants' qualifications otherwise meet the requirements of this state. This clause has been in the New York State law for fifteen years, is regarded as necessary and desirable, and now needs to be revalidated. Similar clauses are contained in the Model Law and in the laws of practically all states. This provision for registration by endorsement is necessary for interstate courtesy and cooperation, also to minimize the nuisance effect of registration for engineers whose practice extends to more than one state.

3. *To permit temporary practice by engineers registered in other states.*—Our present law expressly permits temporary practice by engineers registered in other states, but inconsistently cancels this courtesy by forbidding public officials from accepting plans filed without the seal (authorized by this state). In order to correct this inconsistency, the drafted amendment proposes that the Department may issue a temporary practice permit to a qualified engineer registered in another state, and that plans may then be filed if they are stamped with the registration seal of the other state and are accompanied by a certified copy of the temporary practice permit. Such temporary permit would be for 30 days if no application for license in this state has been filed, and for three months if an application for license has been filed and is pending.

4. *To provide for a full-time paid secretary of the Board of Examiners.*—This is recommended and requested by the Department and by the Board of Examiners. The administrative duties and clerical work of a Board secretary are too great a burden for a practicing engineer having other obligations. A full-time paid secretary would, in addition, be able to take charge of the enforcement of the law including the receiving of complaints and the correction of violations.

5. *To provide for injunctive procedure to stop violations of the law.*—This amendment, drafted by the Attorney General, is strongly recommended by the Attorney General and by the Department, and is earnestly desired by the profession. It would facilitate enforcement of the law and the correction of violations. It would substitute a civil action before a judge instead of a criminal action before a jury, and instead of asking a jury to brand a violator as a criminal we would merely be asking a judge to issue an injunction against continued violation. Such provision in the law has proved highly effective in other states, and is needed in the law of this state.

All engineering societies and individual engineers are urged to support these five proposed amendments.

GEORGIA

Hon. Charles L. Gowen, a member of the House of the General Assembly has asked the Georgia Society of Professional Engineers to appoint a Committee to supply him with the engineering and technical information necessary for the preparation of legislation to prevent in future such disasters as that which occurred recently at the Winecoff Hotel in Atlanta. Harry C. Tober, Jr., was appointed chairman of a committee of 10 members, which was given power to act for the Board of Directors. This committee held a general meeting in January at which final recommendations were approved.

ILLINOIS

The Illinois Society of Professional Engineers held its annual meeting at the Abraham Lincoln Hotel in Springfield, Illinois on January 24 and 25. On the preceding evening a smoker was held for early comers.

Friday morning was devoted to the Atomic Age with an extremely interesting talk on the source of atomic energy by Dr. Edward Teller, physicist connected with the Institute of Nuclear Studies, University of Chicago and with the U. S. Navy's movies of the Bikini tests.

At the General Luncheon a telegram was read from President Ritchie Lawrie, Jr. of the N.E.P.E. Mr. Lawrence E. Peterson, representing the N.S.P.E.

spoke on "The Social Stature of the Professional Engineer." He stressed that the social stature of the engineer is of his own choosing. It depends on how he uses his tools for the greater benefit of man.

V. E. Gunlock, Commissioner of Subways and Superhighways, Chicago, received the Illini award for the best paper in the Illinois Engineer during the last year.

In the business session D. M. Campbell was declared elected President and E. E. Cooper, Vice-President. It was decided to hold the next meeting in Joliet, Illinois.

The secretary reported that the membership increased during the last year from 1400 to 1564.

At the banquet Dean M. L. Enger of the College of Engineering, University introduced President Henry T. Heald of the Illinois Institute of Technology, who spoke on "The Engineer as a Citizen in the Atomic Age." He stated that our civilization has run into an area when the allowable margins of errors are small, even between people, or we are going to the dogs.

The Saturday program was devoted to Conservation and besides a movie on "Clean Water", interesting papers were presented on "Efficiency in the Utilization of Coal," "Marks and Remarks in Soil Conservation" and on the "Illinois River Basin Flood Control Project."

This was the first meeting of the Society under the new plan of professional programs in contrast to the previous technical programs and its success is a good omen.

MICHIGAN

The first annual meeting of the Michigan Society of Professional Engineers, held Wednesday evening, January 22, 1947, at the Engineering Society of Detroit, Rackham Building, showed a growth from the date of organization, February 17, 1946 of approximately 350 members. As a result of the balloting, the following are the first permanent officers of the State Society.

President—Stephen G. Szabo, Mt. Clemens, Michigan—Works Engineer of the Fisher Body Division of General Motors.

First Vice-President—Otto H. Hall, Lansing, Michigan—In charge of the architectural and engineering section of the Michigan Department of Conservation.

Second Vice-President—Hugh E. Keeler, Ann Arbor, Michigan—Professor in Mechanical Engineering at the University of Michigan and Consulting Mechanical and Electrical Engineer.

Secretary—Donald E. Trefry, Detroit, Michigan—Engineer in Lighting Division of the Detroit Edison Company.

Treasurer—Colin J. O'Dell, Detroit, Michigan—President of the O'Dell Engineering Company.

National Representative—Ivan N. Cuthbert, Ann Arbor, Michigan—Principal Engineer for Smith, Hinchman & Grylls, Inc., Detroit, and Special Lecturer for the Extension Department of the University of Michigan.

The result of the balloting was reported by Arthur F. Plant—Chairman of the Tellers who introduced the National Representative, Ivan N. Cuthbert, who in turn, representing the National Society of Professional Engineers, installed President Stephen G. Szabo as first permanent President of the Michigan Society of Professional Engineers. Mr. Szabo then installed the elected officers of the State Society and outlined the aims of the Society for 1947.

NEW JERSEY

The Eighth Annual Land Surveyors' Conference of NJSPE was held at Rutgers University on December 7, 1946. It was attended by 150 members and six highly interesting papers were read among which was one on "Bonded Surveys".

NJSPE is crystallizing very comprehensive and extensive plans for the 1947 Convention scheduled for April 11 and 12 at Newark, N. J. A major feature will be the presentation of industrial, engineering, and other exhibits. Admiral Thomas Kinkaid, Commander of Eastern Sea Frontier, has already been secured as one luncheon speaker.

New Jersey's National Directors, upon returning from the annual NSPE meeting in Atlanta in December, acquainted New Jersey residents, through the press, of the need for a uniform State Fire Safety Code and are presently contemplating the introduction of necessary legislation in the State. Wide-spread publicity has been obtained as the result of New Jersey Directors' action based upon their experience and observations in Atlanta.

The New Jersey Society has completed plans for a very active legislative year. Four or more bills will be introduced at the 171st Legislature. So as to supplement the State Legislative Committee's program, a complete list of all Federal and State legislators from New Jersey was published in the January issue—"New Jersey Engineer".

The January issue—"New Jersey Engineer" was distributed to the Sen iors of the four engineering colleges of the State primarily because this issue contains an article by Professor Frank Mirgain of Rutgers University entitled "The Engineer-in-Training". This is the second of a scheduled series of articles, the first of which was entitled "The Engineer-in-Government" and was published in the October issue of the "New Jersey Engineer".

During the New Jersey Society's recent membership campaign, a new member, George C. Jorgensen of Monmouth-Ocean County Chapter, who himself joined on November 8, 1946, has already secured 18 new members. This should provide inspiration for all members throughout the country. Incidentally, as a result of his accomplishment, Engineer Jorgensen will receive a $100 bond which had been set up by the Membership Campaign Committee as an additional incentive.

NEW YORK

At the request of State President Charles W. Burke, President Eldridge, of the Erie County Chapter has appointed a committee to start work on plans for entertaining engineers attending the National Society's Annual Meeting in Buffalo in December of this year. J. Leo Scanlon is chairman and Edward Numan, Vice-Chairman of this committee.

Major General Thomas F. Farrell, U.S.A., was the guest speaker at the January meeting of the Erie County Chapter. General Farrell described the action of the "Atom Bomb" which victoriously ended the war. Motion pic-

tures depicted the holocaust in Japan and the experiment at Bikini.

A New York Mediation Board has tentatively recognized the right of a group of Consolidated Edison Engineers to organize independently for collective bargaining purposes. The local C.I.O. Union, which had sought to compel the technical group to accept it as the lawful bargaining agent, was turned down by the Board. The New York County Chapter—N.Y.S.P.E.—gave commendable assistance to the technical group.

The formation of County Chapter Committees to study labor matters and to advise Chapter Members on labor problems at the local level is being recommended in Society circles. Plans are under study to coordinate the efforts of such committees through a cenertal State Committee, equipped to obtain competent counsel if and where necessary.

Certain Engineers in the Society believe that the future of the Professional Engineer will be determined very definitely by the outcome of present labor squabbles and efforts to revise labor laws. Your officers would welcome an expression of opinion on this matter from the membership in order that they may properly represent that membership in the higher councils of the Society.

NSPE Vice-President J. F. Fairman, of New York City, was the guest speaker at the February 17th meeting of the Erie County Chapter.

N. Y. State Board of Examiners of P. E.

The 269th meeting of the N. Y. State Board of Examiners for P. E. was held in New York City on January 17. Of a total of 300 applications considered at this meeting, 18 were scheduled for the preliminary examinations, 180 were scheduled for the final examinations, 34 were held for further consideration, 19 were rejected, and 49 were passed, the secretary being directed to hold 46 of these cases until the Registration Law is clarified.

Recent legal rulings have declared invalid the 15-year clause and the interstate endorsement clause in the present law, and amendments are planned for early introduction at the present session of the legislature in order to revalidate these two necessary clauses of the law.

The Board approved the payment of $600 to the National Council of State Boards of Engineering Examiners to cover membership fee in the Council for the year 1947.

Niagara County Chapter

"Executive secretary Frank J. D. Duck, at the January meeting, described his present duties and future plans for increasing the prestige and influence of our organization. Mr. Duck discussed at some length the many plans and ideas he expects will become realities within the next several months. Mr. Duck also told briefly of the plans made to date for the twentieth anniversary convention of the State Society to be held at the Hotel New Yorker, New York City, on May 2 and 3, and for the annual meeting of the national society in Buffalo in December."

Engr. Clarence H. Kremers has been selected as a member of the Air Pollution Board of the City of Niagara Falls, N. Y. He briefly outlined the duties of this newly formed board and mentioned the difficulties which will be encountered to make the new ordinance workable because of the type of industries located in the city. He suggested that all engineers carefully study the brief outline of the ordinance for air pollution control which was handed to the members attending the meeting so that full cooperation may be given when the final rules and regulations are published.

Niagara County Chapter Engineer in the News

Engineers E. H. Coe, Matthew Weber, and J. Arthur Fish have spoken on various phases of the engineering profession to aid in the Kiwanis Club-High School vocational guidance program.

Enr. Thoms L. B. Lyster has served on the City's Advisory Board of Grade Crossing Commissioners.

Engr. George Mack has been appointed a director of the Niagara County Savings Bank.

The following engineers, because of company transfer, have been lost by the Niagara County Chapter and gained by the Wilmington, Del Chapter:—Schyler V. Jenkins, Clyde Gallinger, Harvey Hyland, Floyd LeVan, and Fred Anderson.

OHIO

Chairman Luaces, of the Dayton Chapter's Violations Committee deserves much credit for working out an effective procedure for handling improper listings with the Ohio Bell Telephone Company. Under this procedure the company accepts the classified listings without reservation until such time as a specific complaint that the listing is illegal, is received. Such complaints are referred by the Telephone Company to the proper registration authority for the necessary information. If the licensing authority substantiates the complaint the Company will interview the subscriber involved, taking the position that unless he can produce evidence of his right to be listed, the listing will be discontinued under the disputed clasification. In this event it will be necessary to check the alphabetical section of the directory and correct or omit any improper designation which may appear in connection with the alphabetical listing. It is believed the same procedures could be worked out in other localities.

John F. Hale, was elected NSPE director from Ohio at a January meeting ing of the Board of Trustees. Mr. Hale succeeds J. S. Kennedy as National Director.

Elaborate plans are being made for the program of the O.S.P.E.'s 67th Convention to be held at the Deshler-Wallick Hotel, Columbus, March 20, 21 and 22.

Seventy-four percent of the 444 Engineers employed by the Ohio State Highway Department are members of the Ohio Societly of Professional Engineers. In nine Bureaus and Divisions, in addition to the Director's Office, 100 per cent membership is recorded. Not bad.

PENNSYLVANIA

The officers of the Pittsburgh Chapter would like to know just why the attendance at their monthly meetings is so poor. So, they are doing the obvious thing (which so many of us never think of doing) they are *asking the membership*. A questionnaire is being sent out in an effort to get the answers. Sounds a lot more practical than the usual method of "panning" the mem-

bership. Henry Ward Beecher, a great preacher of an earlier generation once put the problem in this way: "When I find members of my congregation nodding during my sermon, I know for certain it is time for their pastor to *wake up*."

Two big features of the February 6th meeting of the Philadelphia Chapter, was an address by State President LeRoy F. Christman on, "Where go the Engineers?" Also an address by Ray M. Fuller entitled, "Highlights of the National Society of Professional Engineers." Motion pictures of the "Tacoma Bridge Collapse," were shown as part of the entertainment program.

TEXAS

The Texas Society of Professional Engineers is to be congratulated on the high standards set in the working out of all the details of its Eleventh Annual Meeting at Dallas on January 16th and 17th. One of the very impressive features was an elaborate printed program which reflected very effectively the high professional tone evident in the program itself. This smart touch of "showmanship", too often absent in professional activities, helped substantially to emphasize the high ideals which the Texas engineers have set for themselves.

A new Schedule of Minimum Engineering Fees and Salaries, revised as of November 1946, is being distributed rather widely to all interested parties.

Letters From Readers

(*Continued From Page* 14)

at least the bare minimum of equipment to permit independent subsistence therein with no more than the ordinary hazards of living. The only reasonable exception to the general rule would be clubs in which personal service is provided for all members or guests.

Concerning mensuration, Mr. Shults' would do well to consider the proposals advanced by The Duodecimal Society quartered at 20 Carlton Place, Staten Island 4, New York City, whose nureological system has many outstanding points of superiority over the decimal system.

Controls over transit and transportation, as with other industries, should develop from within the industries concerned, with at most, but a regulatory finger in the pie by government.

In the matter of labor relations, government as the representative of the consumer, should be no more than the third party in a three-cornered discussion of a matter under arbitration, if only we can get all three parties to develop the cooperative spirit.

George S. Murphy, New York City.

Changes in Labor Laws Suggested to Senate

(*Continued From Page* 10)

permits appropriate professional units to accept or reject representation by a "labor organization". It assures to professional employees freedom of choice by preventing their choice from being overridden by votes of non-professional employees.

The portion of Sec. 5 of S. 360 which would strike out the proviso at the end of Sec. 8(3) of the present Act would free all employees from the requirement of membership in a labor organization as a condition of employment. This would cover our recommendation numbered (3). Should the committee not see fit to recommend so broad an amendment to Sec. 8 (3) of the Wagner Act, we feel that professional employees, at least, never should be compelled to belong to any labor organization as a condition of their employment. This could be accomplished by the adoption of an amendment reading as follows:

> Section 8 (3) of such Act is amended by inserting after the word "therein" the words "by persons who are not professional employees", so that the subsection thus amended will read as follows:
> "(3) By discriminating in regard to hire or tenure of employment or any term or condition of employment to encourage or discourage membership in any labor organization: Provided, That nothing in this Act, or in the National Industrial Recovery Act (U. S. C., Supp. VII, title 15, secs. 701-712), as amended from time to time, or in any code or agreement approved or prescribed thereunder, or in any other statute of the United States, shall preclude an employer from making an agreement with a labor organization (not established, maintained, or assisted by any action defined in this Act as an unfiar labor practice) to require, as a condition of employment, membership therein, by persons who are not professional employees, if such labor organization is the representative of the employees as provided in section 9 (a) in the appropriate collective bargaining unit covered by such agreement when made."

Beyond question, enactment of these amendments would materially promote harmonious relations between management and professional employees. Such action would minimize the costly and disruptive turmoil which has existed in professional ranks with resulting loss of productive service and effective industrial relations. We see nothing in them to which excepion can be taken by anyone who has at heart the best interest of this tremendously important group. We respectfully request your Committee to include these provisions in whatever legislation for amending the National Labor Relations Act may be developed as the result of the current hearings.

Respectfully submitted,

American Society of Chemical Engs.
by: W. I. Burt, Vice President
Goodrich Tire & Rubber Company
Cleveland, Ohio
American Soc. of Electrical Engs.
by: Clark W. Ransom, Electric Eng.
General Electric Company
Pittsfield, Massachusetts
American Soc. for Eng. Education
by: Harry R. Rogers, President
Brooklyn Polytechnic Institute
Brooklyn, New York
American Society of Civil Engineers
by: Gail A. Hathaway, Special Asst.
to the Chief of Engineers
War Department
American Soc. of Mechanical Engs.
by: William F. Ryan, Asst. Eng. Man.
Stone & Webster Corporation
Boston, Massachusetts
National Soc. of Professional Engs.
by: Ritchie Lawrie, Jr., Con. Eng.
Lawrie & Green
Harrisburg, Pennsylvania
Engineers Joint Council
by: E. Lawrence Chandler
Eastern Representative, A. S. C. E.
Chairman of the Panel

Practice and Ethics Committee

President Ritchie Lawrie, Jr., announces the appointment of Mr. F. O. Mirgain, as chairman of NSPE's Practice and Ethics Committee. Mr. Mirgain is associate Professor of Civil Engineering, Rutgers University, New Brunswick, New Jersey.

Book Reviews

MAGNESIUM FABRICATION

By L. B. Harkins

This book presents authoritative data for all phases of the fabrication of magnesium-alloy sheet, extrusions, and tubing into the finished product.

Of the thousands of workers skilled in light-metal fabrication, principally aluminum, only a limited number possess experience in magnesium alloy. A craftsman trained on aluminum alloys must learn the technics peculiar to magnesium before he is competent to work the metal. Here is a clear explanation of those technics for the worker on the job and for the engineer or student interested in this field.

The book will be of great value to manufacturers contemplating entering the magnesium field. Present and prospective shop owners intrested in the possibilities of magnesium fabrication will find the author's discussion of Industrial Contacts particularly helpful.

Mr. Harkins, while working at the Dow Chemical Company plant realized the definite need for an authoritative compilation of instructional material and data required to work magnesium. This book is the result and it is the first covering all phases of fabricating magnesium metal, including methods of joining, forming and machining.

150 pages. Cloth, 6x9¼ Illustrated. $2.75

PITMAN PUBLISHING CORPORATION

THE AERONAUTICAL DICTIONARY

By Thomas A. Dickinson

Until this book was published, there was nothing in book form so completely up-to-date or so all-inclusive, to which aviation executives, workers, fliers, technicians and hobbyists could turn for authoritative definitions of works peculiar to aviation.

Over 6,000 terms are defined in clear and simple language, regardless of how technical or how difficult the term in question may be. Where necessary drawings and photographs (over 300) are used to emphasize the exact meaning. Where a specific operation is defined, it is told how it is done and why. Where an instrument or tool is defined, the manufacturer's name is listed wherever possible.

The appendix contains numerous charts, tables, bibliography and much other essential data.

484 pages, Cloth, 5¾x8⅜ Illustrated, $3.50

PITMAN PUBLISHING CORP.

PANEL HEATING AND COOLING ANALYSIS

By B. F. Raber and F. W. Hutchinson

This is an extensive and rigorous presentation of the essential background material on panel heating and cooling analysis. This complete and authoritative book was prepared by two pioneering authors after years of research both here and abroad. The book covers the general and design aspects of the maintenance of comfort conditions by the use of radiant surfaces.

Panel Heating and Cooling Analysis is primarily a theoretical study. The general information and qualitative discussion will be of interest to architects and all others concerned with the construction of buildings and their heating equipment. The latter portion of the book presents a thorough treatment of the theoretical aspects of the subject and fits them into a definite design procedure. Divided into three relatively independent sections, the material is so carefully and clearly discussed that it serves equally well as a textbook for senior and graduate courses in ventilating and heating, or air conditioning, and as a working reference for architects, engineers, and heating contractors.

208 pages Cloth, 5⅛x8⅛ $3.00

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STEAM POWER PLANT AUXILIARIES AND ACCESSORIES

Second Edition

By D. J. Duffin

For years operating engineers have relied on this practical manual for quick, sound help in selecting, installing, operating and maintaining their power plant auxiliaries. Now this completely modernized second edition has been expanded to cover all the important changes and developments affecting the efficient performance of such equipment.

Considerable new material—based on best plant practice—is included on reciprocating and centrifugal pumps, methods of boiler feeding, feedwater heaters, economizers and air preheaters, condensers, steam piping of power plants, and steam traps. Over 500 illustrations, the majority of which are new, show the most up-to-date equipment in the field.

584 pages. Cloth, 5½x8 Illustrated. $5.00

McGRAW-HILL BOOK COMPANY

THE ENGINEER AT LAW

By C. B. and J. R. McCullough

The purposes and objectives of the authors of this work are to complement the work of the lawyer with the work of the engineer so that the two fields of endeavor will supplement rather than supplant each other. The engineer who understands the lawyer and the lawyer who understands the engineer are of far greater value in the courtroom than they can possibly be if total strangers to each others' profession.

The authors have covered a field which should attract members of both the legal and the engineering profession and especially members of those professions whose employment has to do with highway and bridge construction. However, the subjects discussed are not confined in application to highway and bridge construction; they apply to all construction where the service of the engineer and the service of the lawyer are required.

Vol. I 448 pages Cloth, 6x9¼
Vol. II 442 pages Cloth, 6x9¼

THE COLLEGIATE PRESS, INC.

SEWERAGE AND SEWAGE TREATMENT

Sixth Edition

By Harold E. Babbitt

This is a factual study of current practices in Sewerage and Sewage Treatment. It stresses design problems, treatment methods and plant operation. Material has been added on high-rate filters and contact aerators, and the discussions of hydraulics and the rational method of determining runoff have been rewritten.

In the preparation of the Sixth Edition, stress had been laid more on problems of design, methods of treatment and operation of plants than on construction. Data in the book have been generally brought up to date, and other changes in practice have been added. Practically all problems in Appendix I have been changed and many new problems are included. One of the most extensive changes made has been in increasing the references to current literature in Appendix II and throughout the text.

692 pages .... Cloth, 5⅛x8½ $6.50

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There are chairmen of investigating committees who ask the witness a question, answer it for him, and then give him a good calling down because he's all wrong.

What's New For Engineers

Requests for further information concerning any item mentioned under this heading will be promptly referred to the manufacturer. It would be appreciated if inquiries be addressed on professional or company letterhead.

Send Inquiries Direct to American Engineer, #6 Church Street, New York, N. Y.

"BASIC GUIDE TO FERROUS METALLURGY"

This is in the form of a plastic-laminated wall chart, 16¼" wide by 21" long which can be cleaned easily and will last a lifetime, and which proves a handy reference source for the engineer, metallurgist and skilled worker.

It contains the best available information provided in schematic form and will prove an invaluable aid in heat-treating, processing, welding, and general fabrication of steels up to 0.9% carbon.

The chart shows the working characteristics of steels at temperatures from -300°F to 299°F. All the important temperature zones, including Hot-working, Annealing, Normalizing, Stress Relieving, Carburizing and Pre-heating for welding are clearly defined. Temperature ranges are shown in 19 colors approximating the characteristic hot-body radiant hues. At the right of the chart 23 fundamental metallurgical terms are defined and explained. A diagram symbolizing the change in grain size with temperature is shown at the left.

The chart is available to industrial executives who request it on *company stationery* stating their position.

For further information address American Engineer, reference No. 560.

FLAME HARDENING APPARATUS

A new 16-page, 2-color catalog describing design and use of Flame Hardening Apparatus has just been published. Items covered in the catalog vary from simple water-cooled torches and tips for hardening small parts to complete apparatus for use on large jobs.

Since all this manufacturer's Flame Hardening Apparatus is light in weight and fully portable, it is possible to bring the heat to the work, with the result large parts may often be treated without removal from the assembly.

The catalog includes equipment for gear hardening and hardening of both internal and external rounds, as well as flat surface hardening, and lists a variety of manifold, regulators, valves and seals.

For further information address American Engineer, reference No. 561.

SCALE DRAWING PAD

A Scale Drawing Pad that enables one to make properly proportioned drawings without use of ruler, drafting board or T-square, and which may be used in the shop or in the field as easily as in the office, is now available.

The pad contains 75 sheets of high quality tracing tissue, enclosed within a cover packet that consists of four cardboard flaps. Various scales are printed on three of the flaps. To use the pad, you simply fold back the cover flap and then place one of the tissue sheets over the scale you wish to employ. Your drawing is made accurately to scale with the aid of the printed lines which show through the tissue.

According to the manufacturer, this pad has been endorsed by draftsmen, designers, engineers, surveyors, builders, field men, sales engineers, students, estimators, patent attorneys, and architects. It is said to be a real time-saver for busy men who wish to convey their ideas quickly and accurately. Drawings made on this pad may be blue-printed. There are no ruled lines on the tisue to confuse the drawing. It gives all the advantages of ruled paper with none of the disadvantages.

The pad measures approximately 9 by 12 inches. Sheets are perforated for easy removal. Valuable information is printed on the back of each cover flap —basic mechanical drafting standards; electrical, welding and architectural symbols; decimals of a foot; decimal equivalents of fractions, with circumferences and areas of circles.

For further information address American Engineer, reference No. 562.

DIESEL POWER TRACTORS, ETC.

Many of the diversified types of work performed by Diesel Power Tractors, etc., are described and shown in this new 16-page, 2-color booklet.

As the title indicates, the publication stresses applications of the entire line of products—Diesel-powered track and wheel-type tractors, Diesel motor graders, Diesel industrial and marine engines and electric sets, bulldozers, scrapers, cable controls and wagons.

For further information address American Engineer, rfeerence No. 563.

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PERSPECTIVE DRAWING INSTRUMENT

New bulletins describing and illustrating a new Perspective Drawing Instrument has just come off the press. This is the new type of drawing instrument that revolutionizes perspective drawing because it draws perspectives accurately in approximately half the time required by other methods.

The bulletins describe the complete operation of the machine showing how it produces perspectives to hair-line accuracy without vanishing points, grids, outriggings or other cumbersome accessories. It enables the object to be viewed from any desired degree or angle, and from any distance.

Perspectives of machine assemblies, architectural renderings and a piano are shown to illustrate the ease with which the machine draws horizontal and verticle elipses, contours and straight line projections. A comparison is given of the time required to draw these perspectives, on the instrument as compared with ordinary, slower methods.

In large size, in the inside of the folder, the complete instrument is shown, together with details of construction. The illustration also shows the steps by which a complete rendered bird's eye view of a factory in perspective is completed from standard plan elevation drawings.

For further information address American Engineer, reference No. 564.

LIQUID CONDITIONING HANDBOOK

A recently completed condensed handbook on Liquid Conditioning gives concise information on the most modern methods and equipment for treatment of water, purification of process liquids, and recovery of valuable substances from waste liquids.

The handbook outlines many different types of units for removal of air and other gases, sediment and other suspended impurities, hardness and alkalinity, and other dissolved impurities such as iron, silica, etc., from water.

Also described are the various types of equipment for special purposes such as in beverage plants, paper mills, laundries, textile plants, municipalities, etc., and for cooling-water treatment, treatment of industrial liquids and for continuous boiler blow-off.

The handbook is illustrated by diagrams showing the principles of design and operation of representative types of equipment. The helpfulness of the handbook is further increased by tabulations of the various impurities found in water, their effects, limits of tolerance in different applications and methods of removal. In addition, a chart of particular interest graphically shows the results of treating a given water by six different water-conditioning methods.

For further information address American Engineer, reference No. 565.

CHLORINATED RUBBER PAINT BASE

A new 36-page technical book on a chlorinated rubber product which before the war was widely used as a base in paints for concrete and other surfaces exposed to action of chemicals, gases, moisture, mold growths, and other destructive agents has just been issued.

The shortage of natural rubber during the war prevented the manufacture of this product. However, protective coatings containing it were subjected to considerable testing during the past few years and the information resulting from these tests is contained in the new book.

The book contains many new starting formulations as well as the results of long-time exposure tests of finishes in which it is used. It is divided into two sections — properties and uses. The finishes discussed are alkyd enamels, finishes for alkaline surfaces, paints resistant to chemicals, varnishes, traffic paints, furniture finishes, marine finishes, and emulsion paints. The use of this material in inks, adhesives, paper coatings, and textile finishes is also discussed.

Although at the present time the availability of the material is somewhat limited more will be available as the supply of natural rubber becomes more plentiful.

For further information address American Engineer, reference No. 566.

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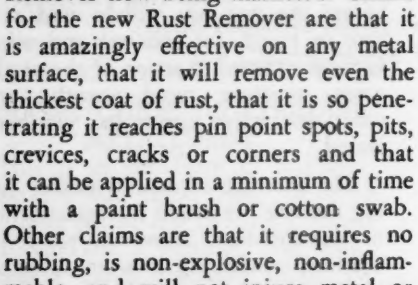
(Near Canal Street) New York, N. Y.

RUST REMOVER

Another war production development hailed by its producers as a new "miracle" chemical, is a liquid Rust Remover now being marketed. Claims for the new Rust Remover are that it is amazingly effective on any metal surface, that it will remove even the thickest coat of rust, that it is so penetrating it reaches pin point spots, pits, crevices, cracks or corners and that it can be applied in a minimum of time with a paint brush or cotton swab. Other claims are that it requires no rubbing, is non-explosive, non-inflammable, and will not injure metal or the hands of the user. Small rust-coated objects may be treated by dipping the articles in a glass, jar or crock of the liquid.



Makers say that the rust removing action is rapid and that after treating the corroded surface, either by hand application or by dipping, will dissolve light rust in a few minutes, while longer applications will remove a coating of rust up to one quarter inch think. Long immersion leaves the surface with a blue-black oxidized finish which materially increases its resistance to further rusting. The product is available to industrial users in any quantity from one gallon to fifty-five gallon drums.

For further information address American Engineer, reference No. 567.

AIR RECOVERY

This recently published 18-page bulletin contains complete data on the design, construction, function and application of activated carbon air recovery panels.

An outstanding feature of this bulletin is the performance chart which provides in one simple and concise tabulation all the data necessary for proper panel selection. Capacities at various resistances, fresh air percentages and approximate hours of service life are shown for each type, size, and series of panel.

Panels are available in standard sizes which conform to commercial air filter dimensions. Each size is available with from one to three rows of perforated, carbon-filled tubes and any one of four tube spacings (distance between tubes in each row) to meet a wide range of performance requirements. In panels having more than one row of tubes each row is staggered so that the tubes in each succeeding row are directly behind those in the preceding row. This design insures uniform and proportional effectiveness of the carbon upon the air flowing through the panel.

Insufficient fresh air ventilation, high outdoor air requirements, and inaccessibility of outdoor air, frequent shortcomings of comfort air conditioning, can often be overcome by the application of air recovery. The air recovery panels described in this bulletin require only *fresh* not *new* air, which can be obtained through purification of recirculated air. And, as recirculaed air is already at the desired temperature and humidity, its conversion to fresh air eliminates and thus saves the conditioning required by using new outdoor air.

These air panels are designed especially for air recovery in normal comfort air conditioning systems, particularly in instances where their use can expand capacity or reduce initial or operating costs. Their compact size and minimum space requirements make them particularly adaptable where space is limited.

For further information address American Engineer, reference No. 568.

HEAVY DUTY POWER TAKE-OFFS

Publication of a bulletin descriptive of seven models of Heavy Duty Power Take-offs is announced by the Truck Equipment Division of this manufacturer.

The bulletin lists take-off operating principles, gives installation data and complete specifications. Emphasis is placed upon these Power Take-off's internal and external gear drive design. This operates as a strong and durable spline (in contrast to the series of rotating or meshing gears found in transmission type take-offs).

Also described are various types of truck-mounted power equipment which can be driven advantageously through take-offs. This includes compressors, generators, gas well bailers, concrete mixers, agricultural machinery, fire-fighting equipment, welders, machine shops, pumps, street sprinklers, home insulation blowers, rock crushers, etc.

For further information address American Engineer, reference No. 569.

HOW TO STOP FIRES QUICKLY

The appalling loss by fire of an estimated 11,000 human lives, and over half a billion dollars in property damage during 1946, indicates an urgent need for a better understanding of how to stop incipient fires at the start.

As a public service, and in the interest of reducing these enormous losses, this company has just published a 24-page illustrated book entitled "What You Should Know About Modern Fire-Fighting Devices," and offers it free of charge to those who will write for it.

The book is of educational nature and not only describes, but illustrates the proper use of the various types of fire-fighting devices for the class of fire for which each is intended.

Should a small industrial fire get beyond the incipient stage of hand portable fire extinguishers before the Fire Department arrives, this book illustrates the use of larger units which can be put into action to extinguish or hold the blaze under control.

It is a most complete and comprehensive textbook on how to quickly stop small fires from becoming big blazes with their awful toll of human lives and property damage.

For further information address American Engineer, reference No. 570.

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POTABLE WATER UNITS

A new 8-page bulletin describing a line of Potable Water Units and their use in the demineralization of highly brackish waters has just been issued. In the pamphlet the equipment is described as capable of producing soft, pleasant-tasting water from almost any inland source.

This profusely illustrated bulletin includes operating data on a typical successful application of the equipment in supplying the water needs of an entire community. It lists the specifications on the standard models available, including the Potable Units designed for permanent installations. The mechanical and chemical theories involved are explained with the aid of schematic drawings and flow diagrams.

The operation involved in these units is described as comparable to a simple cold filtration with the manufacturer's ion-exchange resins acting as the filtering media. No heat and only a negligible amount of electricity is required.

For further information address American Engineer, reference No. 571.

FLOOR RESURFACING

"Over Ruts and Holes" is the title of a recently published folder outlining the overlaying or patching of worn concrete, wood, brick or composition floors with a special resurfacing material. The folder answers questions dealing with product uses, advantages, method of application, material coverages, etc. In addition several typical finished installations on traffic aisles, floors, platforms and outside ramps are described and illustrated, thus providing the reader with a clear picture of the characteristics and advantages of this practical and economical method of floor repair. A free copy of this folder may be obtained by addressing The American Engineer.

For further information address American Engineer, reference No. 572.

GRAPHITE HEAT EXCHANGERS

Publication of a new bulletin, describing standard, seven tube Graphite Heat Exchangers for use under highly corrosive conditions, is announced. The exchangers are available in three sizes of 4'3", 7'3" and 10'3" length with effective outside tube areas of 8.2 sq. ft., 16.4 sq. ft. and 24.6 sq. ft. respectively. All these exchangers have high thermal conductivity and resistance to the action of most acids, alkalis, and other corrosive chemicals.

For further information address American Engineer, reference No. 573.

NEW PROCESS FOR SECURING CORRUGATED ASBESTOS ROOFING AND SIDING

Savings up to 50% in the cost of securing corrugated asbestos roofing and siding to steel frame structures are claimed for new methods announced recently.

The method permits all work to be done from outside the wall or above the roof, eliminating the expense of interior scaffolding and reducing the number of men required on the application crews. Speed of the process is also said to contribute to substantial savings in application costs. Results are said to be superior in strength, appearance, weathertightness and resistance to corrosion.

For further information address American Engineer, reference No. 574.

DIESEL ENGINE COOLING SYSTEMS

A new 20-page booklet, titled "Diesel Engine Cooling Systems," has just been released. It should prove a valuable addition to the reference library of anyone interested in stationary Diesel engine efficiency and lower operating cost.

Profusely illustrated with pictures, diagrams and blueprints, the booklet will help solve many of the problems encountered every day in Diesel engine cooling. It shows how water jacket scale, over-heating, costly break-downs and insurance rates can be greatly reduced or entirely eliminated.

For further information address American Engineer, reference No. 575.

RUGGED DUTY LIGHT BULBS

An 8-page illustrated bulletin describing four types of light bulbs especially designed for rugged-duty service where ordinary light bulbs fail to stand up, has just been issued. Vibration Service lamps with all-flexible construction, Rough Service lamps with flexible 12-anchor filament mounts, and Milltype lamps with all-wire shock-absorbing filament supports and other rugged-duty features, are said to assure continuously efficient service in applications ordinarily destructive to standard type lamps. Traffic Signal lamps are included in the bulletin and featured for commercial and industrial use in view of their extra-rugged construction for continuous "on-off" 24-hour service.

For further information address American Engineer, reference No. 576.

MULTI-STAGE PUMPS

This 6-page, 2-color bulletin describes a line of vertically split case Multi-Stage Pumps. These pumps are built for larger capacities, ranging from 50 to 200 gallons per minute.

These pumps are generally used in direct connection with electric motors, but they may also be driven with steam turbines, gasoline engines or by chain or belt drive arrangements.

They are restricted to clear liquid pumping and are especially applicable to boiler feeding, ice water circulation, brine circulation, sprinkling, general water supply and pneumatic water systems.

For further information address American Engineer, reference No. 577.

THIRD DIMENSION DRAWING MACHINE

A new four-page bulletin just issued illustrates and describes the operation of a new Drawing Machine. It is shown how anyone familiar with the art of "reading prints" can illustrate any object in the third dimension with ease, speed and accuracy. Expensive models or mockups of new designs are often eliminated. Knowledge of other perspective methods or aids—central lineads, grids, etc.—is not necessary to operate the new machine. This new bulletin which also includes a discussion of linear perspective is available upon request to American Engineer.

For further information address American Engineer, reference No. 578.

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PUMP BULLETIN

This new 12-page, 3-color bulletin recently issued will be of considerable interest and value to those who have big pressure, low volume pumping jobs, requiring maximum efficiency. The pump described is designed to replace the complex displacement-type pumps. The bulletin covers technical data, application pictures, cross section drawings of parts, operation and design features, dimensional sketches, assembly procedure.

Pump sizes covered are 10, 12 and 15 inch, with capacities of 20 to 300 gpm, and head range 55 to 250 feet per stage (to pressures of 5000 psi).

Featured and illustrated is the unusual pump application at the rim of Arizona's Grand Canyon where four of these pumps lift water 3200 feet from the reservoir at Indian Garden Springs to supply the needs of Park and El Tovar Hotels on the canyon's rim.

For further information address American Engineer, reference No. 579.

HEAT-PROOF PAINT

Protection against corrosion and scale at higher temperatures than ever before is the prime advantage claimed for this new Heat-Proof Paint. It is a functional paint and is said to prevent hot metals from corroding and scaling at red hot temperatures as high as 1850°F. It is also reported to provide protection to metals in all weather conditions.

The hot metal can be subjected to sudden temperature changes such as quenching immediately in cold water without cracking or peeling of the paint as it follows the contractions and expansions of the metal at all temperatures. The paint is applied while the parts are cold. It dries in about 20 minutes and can be subjected to the red hot temperatures immediately after drying.

Emphasis is placed on the fact that this product is not merely heat-resistant, but positively heat-proof.

For further information address American Engineer, reference No. 580.

NEW SYNTHETIC RESIN

A new-type Synthetic Resin from petroleum which can be applied successfully to iron, brass, bronze, aluminum and highly polished metal, in addition to wood and steel, has been developed.

The substance was tailored to the specifications of the paint and varnish industry and at the time the work was started — three years ago — no satisfactory process had been developed to make high-quality synthetic resins from crude oil. Technicians of the paint and varnish industry cooperated very closely in the development.

The new resin is said to have excellent qualities of adhesion, flexibility and wetting power which particularly fit it for use on surfaces difficult to paint with ordinary paint. As a baked priming coat on automobiles it is reported to be hard, durable, light-fast and chemically resistant. A can-coating that is only 2/10,000th of an inch thick remains unbroken even when the metal sheets are stamped and punched. It withstands the pasteurization treatment of twenty minutes under fifteen pounds of steam pressure at 250 degrees F and is unaffected by the extremely high acidity of grapefruit and certain other canned fruit and vegetable juices. Pigmented films air-dry quickly, have good light stability and retain a high and lasting gloss.

The new resin also promises good results if used as a base for textiles, footwear and rubber adhesive.

There are several types of the resin, and a fair-sized plant soon will be producing the new material in commercial test quantities. It was developed to sell at prices that compare most favorably with other synthetic resins. It is a short-oil-length resin, which means economy of drying oil.

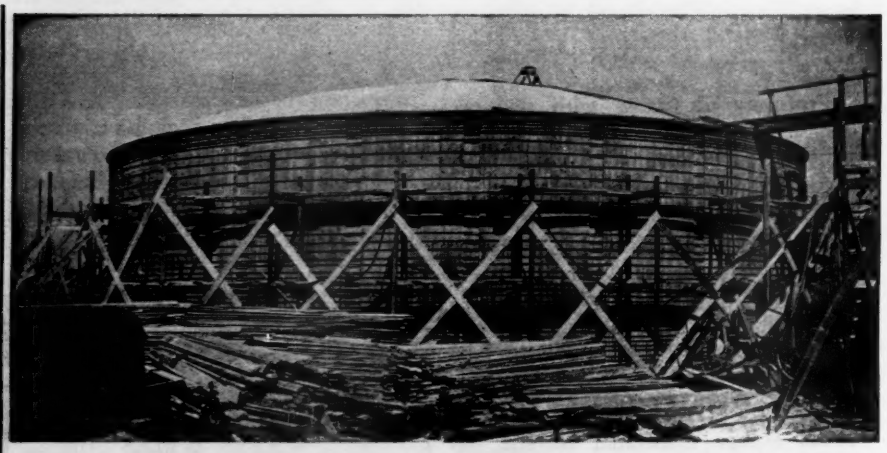
For further information address American Engineer, reference No. 581.

AIR FILTERS

A new 28-page illustrated booklet discusses various types of industrial dust problems and typical applications of Air Filters to such problems.

Included in this highly enlightening booklet are a chart of size and characteristics of air-borne solids and sections dealing with atmospheric dust, and filtered air for: industrial air conditioning, industrial ventilation, drying operations, product finishing, control of bacteria and mold spores, cooling electrical equipment, engines and compressors and miscellaneous industrial applications.

For further information address American Engineer, reference No. 582.



• PRE-STRESSED "GUNITE" TANK •

The partly completed "GUNITE" water storage tank pictured above illustrates modern pre-stressed tank design.

Around the outside of the "GUNITE" wall hoop rods are placed and the segments of these rings are coupled with turnbuckles. Tightening the hoops by means of the turnbuckles to a pre-determined stress produces compression in the 'GUNITE" wall. This pre-stressing is designed to maintain the "GUNITE" in some compression when the tank is full of water, thus preventing elongation of the wall with resultant cracks and leakage.

After the hoops are pre-stressed and the tank tested a covering of mesh reinforced "GUNITE" is placed over the exterior to permanently protect the hoop steel.

The tank illustrated also includes a "PUNITE" domed roof, the ring girder of which is similarly pre-stressed.

Pre-stressed "GUNITE" tanks are bottle tight and maintenance free. We have built scores of such tanks with capacities ranging from 25 thousand to 2½ million gallons. This type of work is completely described and illustrated in our bulletin E2300.

Write for your free copy of bulletin E2300.

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PRODUCTION PAINTING ON ALUMINUM

A new material is now available for applying to aluminum and its alloys which are to be painted or lacquered in high production. No special equipment is required, and existing factory flow-lines are generally not disturbed. According to the manufacturer the outstanding features of this material are: (1) It is applied at room temperature by dip, spray or brush. (2) It reacts chemically and bonds with the aluminum surfaces in from 15 to 60 seconds in a single chemical treatment. (3) It is kept in an ordinary steel tank or container without piping, valves or controls. No special tank or linings are needed. (4)It requires no heat or venting. (5) Its coverage in area-per-gallon is unusually great and it is, therefore, economical to use. (6) It is stable, non-flammable, non-toxic and can be stored for long periods of time. (7) Chemical control is not required. (8) There is no scale build-up or deposit on tank, racks, jigs and fixtures and they do not, therefore, have to be "stripped", "deplated" or otherwise treated. Racks or fixtures may be of steel, copper, brass, etc.

Wrought, cast, die-cast, machined, forged, extruded and other forms of aluminum and its alloys respond to treatment. Aluminum parts with inserts or attachments of other metals or plastics can be treated to form a good bond with paint or lacquer.

Aluminum finished with the new material may be painted immediately after drying, or the work may be held over for subsequent painting.

Firms are invited to submit specimens of their aluminum parts or assemblies for treatment with the material for subsequent painting or lacquering by them.

For further information address American Engineer, reference No. 583.

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OIL PRESSURE SAFETY DEVICE

Machine and engine breakdowns and costly repairs due to pressure lubrication failures will be largely eliminated by an ingenious new oil pressure activated safety devise recently developed. Installation in the lubricating system, any drop in oil pressure below predetermined safe operating levels will activate the unit and energize danger signals or emergency controls of any desired type. With the new device, lubrication pressure failures are detected before bearings freeze and extensive damage has occurred.

Wherever gasoline engine powered installations are involved, this protection is particularly effective. An oil pressure drop will cause the device to break the ignition circuit and the gasoline engine will stop immediately.

Sturdily constructed of extruded aluminum, the device is simply and compactly designed for easy installation and universal adaptability. No alteration in any existing lubricating system beyond the addition of a spur oil line to carry oil pressure to a switch is necessary to install this new "bearing insurance."

For further information address American Engineer, reference No. 584.

INDUSTRIAL DIESEL ENGINES

The many and varied work applications of Diesel engines—industrial engines, electric sets and marine engines—are chronicled in the new 24-page, 2-color booklet published recently.

The profusely illustrated booklet beams its editorial and pictorial spotlight at numerous application fields in which the manufacturer's Diesel engines are identified. Its story includes mention of such applications as those industrial engines utilized in crushing plants, sawmills, mines, cotton gins, hatcheries, oil pumps and oil drilling, steel mills, pipeline pumping, feed mills, asphalt plants, ice plants, waterworks, irrigation pumps, paper mills, brewing companies, locomotives, ditchers, compressors, cranes and shovels. It points to electric sets applied in lighting plants, sand and gravel plants, gilsonite plants and rendering plants and to marine engines powering all types of fishing boats and car ferries.

For further information address American Engineer, reference No. 585.

CAN LABELING TECHNIQUE

A new edition of "Successful Can Labeling," fully revised to include post-war techniques and materials, has been issued recently.

The handbook covers operating practices for both spot and overlap labeling, by hand and by machine. It suggests the best methods for handling various types of label stock, and covers the choice of adhesives and care of machines.

A detailed check-list section gives causes and correctives for common labeling difficulties such as staining, rusting, slipping or crooked labeling, poor adhesion, wrinkling, failure to pick up labels, and tearing.

A special section, "How to Determine Can Temperatures," will prove of particular value in selection of an adhesive for fast, efficient labeling.

For further information address American Engineer, reference No. 586.

OIL OR GAS BURNING DIRECT FIRED HEATER

There has just been published a 12-page, 2-color illustrated bulletin describing a new Heater designed for industrial and commercial use. This bulletin outlines in detail the successful application of stainless steel to combustion chambers used in this self-contained, direct fired, warm air heating unit. Other new aspects discussed are: more efficient combustion; ready fuel convertibility from oil to gas or vice versa; elimination of refractory lining within the combustion chamber. The bulletin stresses the longer life expectancy, lighter weight, compactness and wide range of application of the new Heater.

For further information address American Engineer, reference No. 587.

FLOOR RESURFACING

This recently published 8-page folder describes the use of a heavy-duty floor resurfacer in the repair and resurfacing of floors, traffic aisles and platforms. It contains a clear, concise description of the properties, advantages and methods of application of he resurfacer. Of interest to everyone concerned with the maintenance of industrial floors, this invaluable little booklet is available on request.

For further information address American Engineer, reference No. 588.

ALUMINUM ROOF PAINT

A new Aluminum Roof Paint which forms a reflecting, protective covering over a structure, providing longer life for the surface and reducing inside temperatures by as much as 15 degrees, is announced.

The new paint is processed from a high quality asphalt base and fortified with a specially processed pure aluminum paste. When the paint is applied, the aluminum pigment "leafs" to the surface to form a foil-like, metallic shield against the elements.

The brightness, or reflectivity, of this aluminum shield reflects 80 per cent of the destructive rays of the sun. The roof coating is thus protected from the cooking action to which it is ordinarily subjected by the sun's ultra violet rays. The interior space beneath the roof is insulated against the sun's heat and the inside temperature is reduced by as much as 15 degrees in the summertime.

This double-purpose paint, a new scientific development in roof protection, is suitable for use on smooth or slate roll roofing, asphalt shingles, built up, slag or metal roofs. It is also made for outside metal work such as tanks, flashings, iron fences, etc.

The paint is packaged ready to use in quart, gallon and 5-gallon containers. It requires no thinner, no mixing, and may be applied easily and quickly with a paint brush or spray gun. The paint dries within one hour and the surface can be used in three to four hours after application.

For further information address American Engineer, reference No. 589.

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TWO-SPEED MOTOR TRANSMISSION

A Two-Speed Motor Transmission—a unit that may be used to replace two-speed motors, with the added advantage of providing special ratios not obtainable with standard two-speed motors, was announced recently.

Direct motor speed, neutral point, and any desired reduction up to 6.25 to 1 are obtained through an automotive-type gear shift lever. Standard reductions are 1½ to 1; 2 to 1; 3 to 1; 4 to 1. Units are manufactured to apply on motor frames, Nos. 224, 225 and 254 are mounted upon flanged-type end shield and can be swiveled about on the face of the flange so that the shifting lever may be in any one of three different positions, 90 degrees apart (either one of two horizontal and one vertical (upright) position). In the larger sizes these new Two-speed Transmissions are made with modified base mounting, corresponding with legs of motor frame. Four to six week delivery can be given on standard models.

For further information address American Engineer, reference No. 590.

New Repellent

A new insect repellent developed by the Naval Medical Research Institute at Bethesda, Md., has proved highly efficient as a protective agent against mosquitoes, gnats, black flies, and other biting insects. In actual field tests in the tropics this Repellent protected from six to ten hours when applied in small amounts to the skin and for from seven to ten days when sprayed on clothing. In northern temperate climates the repellent has been known to protect for as long as 36 hours.

For further information address American Engineer, reference No. 591.

VOLTAGE CONTROL EQUIPMENT

A new 12-page bulletin has just been released by a company specializing in the manufacture of Voltage Control Equipment.

The bulletin clearly illustrates and describes a complete line of variable transformers, automatic voltage regulators, a-c power supplies, and special custom-built equipment, such as remote positioners and theatre dimmers.

Detailed description including many charts, graphs, and dimensional drawings makes this bulletin complete for engineers seeking the answer to voltage control problems.

For further information address American Engineer, reference No. 592.

GENERAL SERVICE ROTARY PUMPS

This is an 8-page, 2-color bulletin describing small capacity rotary pumps which have been designed to meet the severest service requirements in various industries. The in-built stamina of these pumps assures long life and low maintenance wherever installed. They can be used with advantage in the following industries: automobile and aircraft, beverage, chemical, food products, marine, paint and varnish, petroleum, plastic, public utilities, railroads, soap and cosmetic and steel industries.

The bulletin is illustrated with photographs and mechanical drawings and full information regarding capacities, pressures and power requirements of the various size pumps.

For further information address American Engineer, reference No. 593.

PAPER ILLUSTRATES DIVERSIFIED USES OF STEEL

Recently published is an 8-page newspaper illustrating end uses of steel with a series of unusual action type photographs.

Printed by the rotogravure process the paper rivals in interest and attractiveness the picture section of the Sunday edition of the leading metropolitan dailies. A copy may be secured free by asking for Steel Pictorial, issue No. 19.

For further information address American Engineer, reference No. 594.

SILICONES AND THEIR USES

Silicones are finding increasing application in diversified industrial fields due to their unique properties. Few synthetic materials have found such wide acceptance or aroused such interest, among scientists, engineers, designers, and business men.

To meet this increasing diversification, this manufacturer is constantly developing new Silicone products to solve specific problems. In all of their forms, the silicones extend permissible operating temperatures far above and below those at which comparable organic materials are serviceable.

These Silicone products are described in the new 12-page, 2-color bulletin which lists all of the Silicone products now available, and contains many charts and graphs, descriptive of the unusual properties of this rapidly increasing family of organo-silicon oxide polymers.

For further information address American Engineer, reference No. 595.

HEAVY DUTY ROTARY PUMPS

This is a 6-page, 2-color bulletin containing full information regarding a line of Heavy Duty Rotary Pumps, expressly designed for handling liquids comparatively free from abrasive or corrosive substances. These include kerosene, benzene, gasoline, alcohol, dyes, bleaching fluids, inks, sizing, pyroxylin, shellac, varnish, paints, creosote, cellulose, rayon, turpentine, viscose, film dopes, linseed oil, castor oil, cottonseed oil, quenching oil, soap solution, tar oil, mineral seal oil, transformer oil, lubricating oil, and fuel oil.

In addition to these liquids the pumps are regularly used for handling extremely viscous liquids such as tar, molasses, heavy oils, and other liquids of this nature. They are capable of handling a considerable amount of air or gas in the liquid, and can be supplied with steam jackets for liquids which become solid when unheated, such as asphalt, rosin, lard, soap and grease.

The bulletin is profusely illustrated and contains performance charts and tables giving sizes, displacements and dimensions.

For further information address American Engineer, reference No. 596.

TOPOGRAPHIC SURVEYS FROM THE AIR

A 16-page bulletin published recently describes how large areas of ground can be surveyed from the air and topographic maps made to 2', 5', 10' or 20' contours from aerial photographs at a considerable saving over the cost of conventional ground surveys. The publication is a symposium of articles by well known highway officials describing how this type of contour map developed from aerial survey photographs has been used with great economy of money and time in determining the most feasible location for highways. It is pointed out that the same basic method is applicable to other types of survey work for locating plants, mining operations, rail and transportation lines, flood control and reservoir surveys and many other purposes.

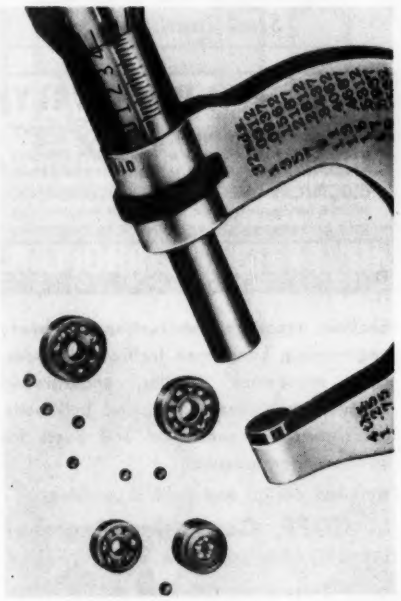
This aerial survey technique was used extensively in surveying plant sites before and during the war. Its use by Industry is now being resumed.

For further information address American Engineer, reference No. 597.

MICRO BALL BEARINGS

A new line of precision solid-race ball bearings in radial and pivot designs is now being produced in quantity in both English and Metric dimensions from 5/32" to 3/8" outside diameter.

For compact mechanisms or instruments, where accuracy, low friction, high capacity and long life are important, these bearings offer high performance at moderate cost.



Full-race radial bearings of 1/4" to 3/8" outside in inch sizes, and pivot (angular ball-contact) bearings from 5/32" to 3/8" O.D. are offered. The pivot bearings will tolerate substantial misalignment of shafts and are fitted with dust cap. All bearing rings and cups are machined from solid bar alloy steel, heat-treated to optimum properties, micro-finished on running surfaces and ground on the exterior. Special non-corrosive or non-magnetic materials are also available. Normal tolerance for all sizes and types is ABEC 1, as in Standard precision bearings. For finer requirements, the radial bearings are also available in ABEC 5 (A-series).

For further information address American Engineer, reference No. 598.

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CIRCULAR SLIDE RULE

The precision of a 12-inch slide rule is combined with pocket-size convenience in the simplified Circular Slide Rule recently received on the market. Only 4½ inches in diameter, this new type of circular slide rule incorporates many advantages over both traditional slide rules and conventional circular slide rules.

Accuracy is enhanced by locating the most-used scales close to the edge, so that each is actually 12½ inches long. Easy reading is assured by use of contrasting colors on scales. Also in problems of proportion or the like, such contrasting colors aid greatly in remembering which variable each scale relates to. Graduations are reproduced on facing surfaces, protected with a thin plastic lamination, so that parallax error is virtually eliminated. Precision centering and durable construction eliminate need for centering adjustment. A further feature, which makes the instrument of greater usefulness to a wider group of users, is elimination of the seldom-used scales found on many slide rules. The new slide rule carries the usual C and D scales, plus a log-log scale ranging from 1.01 to 100, which appears as an inner spiral of almost three turns and which is conveniently arranged for computing in one setting compound interest problems, both for annual and quarterly compounding. Numerous engineering problems, such as in the field of gas compression and expansion, also may be easily and accurately solved on this scale.

The new Circular Slide Rule is precision manufactured from tough, non-warping, non-inflammable plastic which is unaffected by moisture, perspiration, or ink. It can be easily cleaned with a damp cloth. Clear, concise directions are printed on the back. It is furnished in an attractive leather case which easily slips into the pocket.

For further information address American Engineer, reference No. 599.

TACHOMETERS

A new 16-page catalog featuring an extensive line of Tachometers is available upon request. This catalog describes and illustrates different Tachometers for particular applications, lists ranges and driving ratios, and other pertinent information regarding continuous indicating Portable and Fixed Mounted Types, and the accessories required for many standard and special driving arrangements.

For further information address American Engineer, reference No. 600.

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SURVEYING ALTIMETER

A new series of Surveying Altimeters has just been announced. Made in several models to cover all ranges of elevation above and below sea-level, laboratory tests have shown these instruments to respond to elevation changes in inches, or a sensitivity of better than one part in twelve thousand. Throughout the entire range, accuracy is better than one part in one thousand.

These instruments are reported to have proved themselves ideal for all preliminary survey work, and will stand up under rugged field service. Each instrument comes encased in a leather carrying case with hand and shoulder straps and will withstand the jolts, jars and vibrations in all conceivable field uses without affecting the sensitivity or accuracy.

The particular system of instrumentation used exclusively by the maker of these instruments is the first new principle used in Aneroid construction in over a hundred years. Ever since the time of Vidi, all aneroid altimeters and barometers have been constructed on the chain-and-lever principle, or minor adaptations, whereby the diaphragm fluctuations have been conveyed to readings on the dial through a combination of pivots, pinions, sectors, chains, bearings and levers, each of which represents a frictional part to detract from the sensitivity and accuracy of the instrument. Furthermore, the errors introduced by these parts increase with use. All these devices are eliminated in the new Altimeter, wherein diaphragm movement is directly and without friction read in terms of inches pressure or feet altitude on the dial. Instrument operates on the nul or zero-gauging system. Is so completely compensated for instrument temperature error that no correction is necessary. Instrument indicates altitude immediately without lag and it is never necessary to "tap" the glass or vibrate the instrument in taking readings. Indicators are knife edge and needle point design with mirror to eliminate parallax and give accurate readings. Diameter of dial, 4¾ inches. Weight, with leather carrying case, two pounds.

For further information address American Engineer, reference No. 601.

INSULATING COATING

A 40-page bulletin just off the pre describes a new Insulating Coating which the excellent heat and light r flecting value of aluminum plus t unusual acid, alkali, corrosive fu and water repellence of mineral asph has been combined as one in a dupl coating.

Highly refined mineral asphalt used as a vehicle to carry the aluminu pigment. It penetrates concrete, woo roofing compositions and other poro materials. It bonds to all these mate als, including metal and glass, to wh it adheres tenaciously. The asph material used in this new preparati is so flexible and elastic that it w stretch beyond requirements and is u affected by variations in temperatu changes from 30° below zero up t 500°F. It is not affected by the co efficient of expansion of any materials to which it may be applied.

The bulletin contains considerable technical information and lists many applications for which the product is suitable.

For further information address Ameri Engineer, reference No. 602.